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ABSTRACT

Seven articles on higher education research and development are presented, including a review of higher education research pertaining to equality of opportunity and accountability. Remaining articles cover the following: an evaluation of college-level student services in Australia; perceptions of academic scientists, employers, graduates and others concerning the relevance of undergraduate science courses to professional employment; a survey of students' traits and attitudes about the University of New England, Australia; the role of university counselors in helping students achieve academic goals; an assessment of "The Journal of Tertiary Education Administration," which first appeared in October 1979; and reviews of two books on barriers to adult involvement in higher education. Article titles and authors are as follows: "Part II: Equality of Opportunity and Accountability: 1966-1982" (D. S. Anderson, E. Eaton); "Reflections of an Evaluator" (Ernest Roe); "The Relevance of Tertiary Science Courses to Professional Employment: Who Decides and How" (A. P. Prosser); "Students' Personality and Satisfaction with an Australian University: A Study of Interdisciplinary Differences" (David Watkins); and "Counsellor Contribution to Academic Goals: A Team Work Approach" (C. Williams, M. Shaw). (SW)

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Australian Higher Education Research and Society

PART II: EQUALITY OF OPPORTUNITY AND ACCOUNTABILITY: 1966-1982

D. S. Anderson and E. Eaton
Australian National University

ABSTRACT

This is the second part of a review of research on higher education since World War II. Part I, published in the previous issue of this Journal, examined how research responded to post-war reconstruction of the later 1940s and the rising community expectations for education of the 1950s and 1960s. In Part II the themes are equality of opportunity and the end of expansion. By the mid-1960s many researchers were questioning the representativeness of participation in higher education and the nature of the education process. More recently some of the research questions have been reminiscent of the late 1940s, that is, how can the efficiency of higher education be improved. Whereas expansion and optimism characterised the first thirty post-war years however, the context is now one of reduced resources and some pessimism.

THE SEARCH FOR EQUALITY: 1966-1975

In Part I of this survey we saw how Australian research on higher education responded to the needs of the time. The period 1945-1955 was of post-War reconstruction and development in which, for the first time, universities came to be seen as institutes of national purpose. Universities were to provide the high level professional manpower for the new society and the early researchers of this period asked the question: who has the talent for university education? They designed studies which would discover the key to predicting academic success. By 1955, it was widely realised that there was more to success and failure than the attributes which students brought with them and researchers began to question what went on in universities.

At the start of the second post-War decade universities, which had just recovered from the flood of ex-service students, were subjected to an even greater invasion by thousands of young school leavers representing a new demand for higher education. Not only was higher education viewed by government as a means for social and technological progress, it was also seen for the first time by a large section of the population as a means of enhancing individual life-chances. Many research studies adopted an interactionist standpoint asking how different sorts of students, many of them from backgrounds unfamiliar with higher education, fared in various learning environments.

The second decade of post-War higher education was the era of Murray, whose Report had recommended to a willing Commonwealth Government that it should accept responsibility for financing and co-ordinating university expansion.

Towards the end of the 1950s it became apparent that expansion on its own was not enough: policy-makers wanted higher education to adapt to the needs of society by providing more high level technologists and more applied research workers. Once again a report told government what it wanted to hear and the recommendation of the Martin Report for a two-part system of higher education was quickly adopted.

Two views had been influencing the development of higher education in the early 1960s and the Martin Committee accepted both. The first was the widespread belief among economists that higher education contributed to growth, that in technologically advanced societies investment in 'human capital' had been a precursor to growth and would continue to be:

> "If a community devotes additional resources to education, growth is likely to be fostered in at least four main ways. Firstly, the work force should itself become more skilled and efficient at doing a given task. Secondly, existing knowledge may be applied more rapidly in the modernization of capital equipment, and in the introduction of new products and of new methods for producing old products. Thirdly, new knowledge may be acquired. Fourthly, improved methods of management, whether at the level of decision-making or at that of detailed control, may become available (p. 6)".

In support of its assumption the Committee cited OECD data for twenty-two countries showing a more or less linear association between enrolment rates and Gross National Product. That assumption would now appear to be somewhat dented.

The second force was a drive for social justice. Martin cited evidence from studies by ACER and others that higher education had been the province of a social élite, with less than 2 per cent of the sons and less than 1 per cent of the daughters of unskilled or semiskilled fathers enrolled full-time in university courses. The Committee stated its belief that "each member of the community should have access to as much formal education as his or her ability warrants" and expressed the hope that the 10,000 new Commonwealth secondary scholarships would help more able young people to complete secondary school.

The new college of advanced education system, which followed the Martin recommendations, expanded faster than the universities. In 1968 some 40,000 students were enrolled in tertiary courses in the colleges (the fact that no reliable figures on college enrolments are available for preceding years testifies to the dearth of interest in the non-university higher institutions). At this time, CAEs accounted for approximately one-quarter of the total Australian tertiary population, the universities for two-thirds, and teachers colleges for the remainder.

The balance had shifted dramatically by 1975; CAE enrolments rose from 49,000 in 1968 to 126,000, a figure representing a growth rate of about 14 per cent per annum, although it must be remembered that the teachers colleges had been absorbed into the CAE sector by this time. During the period 1955-1975, university enrolments grew by 8 per cent per annum (Karmel, 1980). In 1975 there were 73 CAEs and 19 universities; the number of CAEs was subsequently to peak at over 80 and then decline in the 1980s with enforced amalgamations.

The Martin Committee's recommendation that teacher education should be developed through autonomous Boards of Teacher Education had been rejected by the Commonwealth Government. This decision attracted unfavourable criticism, as did the Government's rejection of Martin's proposal for establishing an Australian Tertiary Education Commission which would have brought universities and colleges of advanced education into a single system of planning. In the preface to what appears to be the first major publication ever devoted to an expert analysis of the nature and efficiency of higher education in Australia, E.L. Wheelwright states:

> "The recommendations of the Martin Report go only part of the way towards meeting [Australia's higher education] needs, as formulated by our contributors, but the most significant of even these modest proposals have been rejected and emasculated by the Commonwealth Government (p. xiii).

The tradition of single-purpose government teachers colleges controlled and financed by the State education departments ended in 1972 when the Commonwealth Government announced its intention to extend to all such institutions the same matching arrangements then applying to the financial provisions for universities and CAEs (Harman and Selby Smith, 1981). The recommendation was subsequently adopted by the newly elected Labor Government in 1973, so that teachers colleges became part of the CAE sector and the two-part structure for Australian higher education was firmly established.

Criticism of the way in which the binary system was developing reached a climax at an important national conference on the planning of higher education held in 1969 (McCaig, 1973). The conference was the first of its kind held in Australia and marked the beginnings of research interest in this area, of which the planning study, Regional Colleges (Anderson, Batt, Beswick, Harman and Selby Smith, 1975) is the most voluminous example. The conference recommendations provide an index of informed opinion at that time:

> "That higher education should be served by a diversity of institutions to cater for a wide range of individual needs and preferences, and not on the basis of two or three narrowly specified types of institutions since students do not fall into simply defined groups, such as those with analytical minds and those with practical minds or those with vocational interests and those with non-vocational interests ...
>
> That in planning the provision of higher education special attention be given to the problems of those who, as a consequence of cultural differences or socio-economic disadvantage, do not have the same opportunities for progression to higher education as the rest of the community (pp. 179-180)".

The theme of equality, to which a variety of meanings were attached, pervaded

discussions of higher education as the CAE sector developed. In the Martin Report, equality referred to intellectual standards of courses. It proposed non-degree professional courses in the technologies and other vocational areas which would be "different but complementary" to university-type education. The first report of the Commonwealth Advisory Committee on Advanced Education (Wark, 1966) gave currency to the slogan of "different but equal":

> "Colleges of advanced education should aim to provide a range of education of a standard of excellence and richness of content at least equal to that of any sector of tertiary education in this country (p. 24)".

Government acceptance of the Sweeney Committee's (1969) recommendations for making academic salary levels in the CAEs comparable to those in universities was an implicit recognition that there was equality of intellectual standards between the two types of institutions.

In the event, the CAEs drew closer in character to the universities as time went on in a process which came to be called upward academic drift. The trend was resisted by the Federal Government which was particularly opposed to the colleges becoming degree-granting institutions, the official argument being that if the CAEs "by a gradual process of bootstrap lifting were to transform themselves into full-scale traditional universities, as the NSW University of Technology did, the whole process of creating new institutions would have to be gone through again" (Murray-Smith, 1971: 344).

By the latter half of the 1970s it appeared to some, particularly those in the university faction who had watched the development with some unease, that since the college network had become so similar to the universities, "the whole idea of a binary system of 'equal but different' [seems] to have disappeared within the passing of a single decade. It is now left to a third force in post-secondary education, namely the TAFE institutions, to pick up the type of programme which had been so hotly dropped by the CAEs" (R. King, 1978: 74).

It would seem that at the institutional level the forces operating for similarity, if not equality between institutions had proved rather more powerful than those for diversity.

Although the universities did not expand at the same rapid rate as the CAEs, the sector continued to grow steadily up until the mid-1970s. Between 1966 and 1975, seven new universities were established, four of them regional universities which helped a little to expand opportunities for university education outside the capital cities (Harman and Selby Smith, 1981).

The social spectrum of universities did not appear to change greatly despite expansion and the concern of Martin and others that there should be less "wastage" due to the failure of large numbers of children from poor families to complete their education. During the latter 1960s there was growing support for more representative participation in higher education; the argument however came to be based increasingly on considerations of social justice rather than wastage of talent.

More importantly, demands for educational reform in relation to equality of opportunity and adequacy of provision at all levels of education began to receive growing support from the public and by 1972 it had become a major political issue. The Labor Party was particularly responsive to the changed climate, and E.G. Whitlam's policy speech included a radical programme for educational reform. According to Fitzgerald this represented "a redefinition of Labor's philosophy in terms of an affluent society ... they saw the issues no longer as being related to lack of leisure and inequality of wealth but rather as involving the use of leisure and removing educational inequality" (R. Fitzgerald, 1975: 266).

The only attempt in the history of Australian higher education to directly change the social composition of the student body by government action occurred in 1974 when the new Labor Government abolished tuition fees for tertiary education, and at the same time established the Tertiary Education Assistance Scheme (TEAS) to provide

living allowances for all students (subject to a means test) who were accepted for study at an approved tertiary institution. Now it seemed that the only sector of public education that had required substantial fees was as open, on economic grounds, as primary, secondary and technical education.

The change from viewing higher education almost solely (as in the Murray Report) or primarily (as in the Martin Report) in terms of economic considerations to embrace the idea of a right to participate is reflected in the nature and scope of the enquiries undertaken by and on behalf of government instrumentalities during the late 1960s and early 1970s. The Committee of Enquiry into Education in South Australia (Karmel, 1971) took as its main theme the problem of equalising educational outcomes, an important doctrine of social reform which pervaded much of the policy-making in education in subsequent years. Following a report for the Commonwealth Government, Schools in Australia (Karmel, 1973) the Commonwealth Schools Commission was established to advise the Government on the allocation of funds for schools on the basis of need, a development intended to assist the many students from poor backgrounds.

The Commission of Inquiry into Poverty, established in 1973, also generated an important series of studies which helped to fill a curious gap in our knowledge. Up until that time a great deal was known about those who made it to higher education, but those groups from which few participated, such as the poor in inner-city suburbs, country people and Aborigines, had scarcely engaged the interest of researchers.

Of course no discussion of equality in higher education in Australia would be complete without mention of the Committee on Open University, appointed by the Commonwealth Government in 1973 to "look broadly at how people at present deprived of opportunities for tertiary education could be enabled to have them" (Committee on Open University, 1974: 1). This Committee presented a number of recommendations to the Australian Universities Commission aimed at improving teaching and learning among entrants with varied backgrounds and levels of ability as a concomitant of the expanding opportunities for admission. However, in a sense, the report was too late for by 1974 it was clear that there were limits to growth and any reforms would have to be made without additional financial commitments.

At this time a strengthening demand for higher education was becoming apparent among people in their 20s and 30s, who for reasons of circumstance or of motivation had not followed the usual track which led directly from school to university or college. By 1975 it was clear that increases in mature age student participation rates were creating a new pattern in higher education in Australia (as in most Western countries), a trend which the abolition of fees, the introduction of TEAS and the short-lived National Employment and Training Scheme helped to encourage. All four Education Commissions[1] had indicated their support for the principle of recurrent or "life-long" education and had appealed to it as a basis for various recommendations (J. McDonell, 1978: 41), and most universities and colleges had developed entry provisions favouring mature age applicants, particularly those who had suffered from educational or social disadvantages.

This growing institutional commitment to mature age entrants was presumably associated with another enrolment trend which had begun to emerge by the mid-1970s, namely a decline in the growth of direct, "normal age" entrants. It was generally agreed that the extraordinary expansion of university facilities and student numbers which had continued since the Second World War was slowing up. The Australian Universities Commission's recommendations for the triennium beginning in 1976 were rejected as part of the Labor Government's budget decisions. The triennial system was interrupted for the 1976 calendar year, and the universities and CAEs were instructed to maintain their intakes at the 1976 and 1977 levels respectively. Each sector suffered cuts in real per capita terms in recurrent funding and funds for capital projects. These developments marked the end of an era of sustained and rapid expansion of higher education in Australia, and the beginning of a period of no growth and decline.

Research Centres

The quickening interest of government in research led to the establishment of three sources of funding: the Australian Research Grants Committee in 1965, which provided support for scientific research including education; the provision in 1967 of substantial funds for research support through the Commonwealth Advisory Committee on Advanced Education (reconstituted later as the Commission on Advanced Education); and in 1970 the establishment of the Australian Advisory Committee on Research and Development in Education (later renamed the Education Research and Development Committee). Further support for higher education research was provided by the Australian Vice-Chancellors' Committee which in 1969 set up the Steering Committee on Research and Experiment in Education Matters (SCREEM). By 1981 only the first of these initiatives would remain.

Researchers also began to organise themselves; in 1971 the Australian Association for Research in Education was founded and, in 1972, the Higher Education Research and Development Society of Australia.

After reviewing the position of educational research in Australia in 1972, the late Dr W.C. Radford was able to feel some elation: "Research and development in education are immeasurably better off now than a decade ago, far better off than ever before in Australia" (Radford, 1973: 116). For education research in universities and colleges, a most important development was the establishment of the higher education research and development units. These helped shift the focus of research attention away from attempts to predict success and on to the means of helping students achieve it.

In 1965 only the universities of Melbourne and New South Wales had such centres. Melbourne's Education Research Office and University Teaching Office (set up in 1957 and 1961 respectively) and the NSW Educational Research Unit (renamed the Tertiary Education Research Centre when it was expanded and reorganised in 1968) grew out of institutional concern over high failure rates. The audio-visual section and the teaching and research office at Melbourne were almagamated in 1968 to become the Centre for the Study of Higher Education, a pattern which was to be followed by most of the more recent teaching/research units, although each gives a different emphasis to the areas of audio-visual facilities, evaluation of teaching and learning, research, and staff development (Miller, 1976).

Units were established at Macquarie (1967), Western Australia (1968), Monash (1966) and Queensland (1973); progress made by these six centres helped provide the impetus for developments in other universities during the 1970s. Further encouragement came in a report compiled under the auspices of the AVCC's sub-committee on Educational Research and Development (AVCC, 1973) as well as from the Universities Commission which stated in its Fifth Report that "all universities should operate such units. Their cost is not great in relation to total expenditure on teaching and research and there is evidence that considerable benefits flow from them" (AUC, 1972: 102).

Whereas the university units at Melbourne, New South Wales and Monash began as research offices, most of the later units (Adelaide, 1973; Griffith, 1975; Flinders, 1975; Tasmania, 1975; New England, 1976; ANU, 1975; Murdoch, 1976; Wollongong, 1979; Deakin, 1980; Sydney, 1981) commenced with much broader mandates. By 1977 all but four of the nineteen Australian universities and many of the CAEs had units established. A similar trend occurred in New Zealand with four of the six universities setting up teaching/research centres between 1969 and 1976.(2)

Action by Students

Student agitation was something of a catalyst for these developments. Initially

the focus of discontent was external to the universities and colleges, the Vietnam War and conscription being the main issues. Then the protest turned inward and universities themselves became the target as students, in action which was frequently violent, demanded participation in policy-making and reform of the curriculum (which should be "relevant"), teaching and assessment procedures. Barbara Falk's article, "Protest in Contemporary Society", published in 1972, is one of the most interesting analyses of student protest in this country. The period which she describes seems strangely remote when viewed from the present conservative climate. It reveals some of the optimism and idealism of the time and it deserves to be quoted at length:

> "Analysis of the various student groups shows that both (the radical and moderate) groups are outstanding academically and unlikely to become 'drop outs'. A large proportion come from upper-middle-class families with liberal political backgrounds. The existence of the second group, the moderates, has been explained in terms of the increasing size of universities and consequent impersonal university government. Bureaucracy as opposed to traditional forms of government does not inspire loyalty, and in the multiplicity of committees students see no way that their wishes and ideas can be influential. They call for an effective voice in the government of the university ... They also express dissatisfaction with their academic experience. They find that the need to provide professional training often contradicts the university's professed objective of free inquiry. The stress on examinations keep them in a state of dependency while the value of intellectual independence is stressed. The rigid divisions of the curriculum into narrowly specialised subject areas and hidebound methods of instruction, made even more ineffective by poor student-staff ratios, lead students to believe that idealistic statements about the education of the whole man are hypocritical. These students, as would be expected, are concerned about social, economic and political justice and differ from the radicals on tactics: they are not committed to the revolutionary path. It is a mistake to regard them as being led by the nose by the radical few, or as the victims of outside influences (pp. 74-75)".

The study upon which Falk based these comments was carried out at the University of Melbourne in 1969 (Gardner, Sheil and Taylor, 1970) and appears to be the only empirical investigation of student activism in Australia, although numerous journals featured articles on student protest written by administrators, academics and students themselves, some journals devoting whole issues to discussions of the phenomenon (see Harman, 1974); and of course the popular press had a field day.

Graham Little's The University Experience (1970), the first major sociological study of Australian university students, presents a picture of students at Melbourne University in 1967 which was in sharp contrast to the mood prevailing just a few years later. Aware of the discrepancy, Little's second book, Faces on the Campus (Little, 1975) attempted, among other things, to place student unrest and the related phenomenon of dropping out in its broader context. Now the wheel has turned and the present generation of students rarely make the headlines except perhaps for the occasional report on the problem of graduate employment or a protest on the falling value of student financial aid.

The students' case for improvements to teaching and learning and for a greater voice in institutional decision-making had some influence and the protests led to, or hastened, several reforms. Financial sponsorship of research in university education by the Australian Union of Students (AUS) predates that of the AVCC, and during the late 1960s and early 1970s these organisations were influential in drawing attention to inadequacies in the teaching process. The AUS made a series of submissions in the early 1970s to the AVCC and the Universities Commission on the whole question of improving teaching and learning in the universities and both bodies subsequently

encouraged the establishment of teaching/research units. The process of higher education which had been the subject of caustic comment by a series of researchers starting with Hohne in the 1940s was at last to receive institutional attention.

Focus on Teaching

This climate fostered the introduction of innovative methods of instruction, many of them based upon important overseas development in the field - for instance, the Keller Plan or personalised systems of instruction (Keller, 1968); micro-teaching (Allen and Clark, 1967; Turney, 1970; Turney, Clift, Duncan and Traill, 1973); the use of educational technology to create more individualised teaching strategies, such as self-instructional modules (Postlethwaite, 1969; Brewer, 1974) and small group teaching (Beard, 1970; Baumgart, 1974; Powell, 1974); research specifically concerned with improving lecturers' performance includes that by Magin (1973) and Stanton (1970, 1972). In 1971, the AVCC, on recommendation of their newly created Steering Committee on Research and Development into Educational Matters, made grants totalling $23,000 to support work in these areas. The following list of research topics SCREEM encouraged provides a good picture of much of the research activity of the new teaching and research units:

- Possibilities and problems of teaching in groups of different sizes, particularly teaching in small groups
- Evaluation of effectiveness of teaching by use of audio-visual aids within Australian universities
- Evaluation of effectiveness of different forms of examinations and different examining practices
- Studies of workloads placed on undergraduates
- Development of new teaching strategies.

The University Teaching Project at Melbourne (Moorhouse and Falk, 1963) and the later Centre for the Study of Higher Education (Falk, 1967, 1969, 1971; Falk and Lee Dow, 1971a, 1971b) influenced the approaches adopted by the more recently established units to the problem of improving teaching, particularly in developing the use of student evaluations.[3] The Melbourne approach to such evaluations differed significantly from the general student ratings of courses current in American higher institutions at the time in that it was less concerned with narrow measures of lecturing ability than with all facets of teaching - course content and textbooks, workload, study methods, the balance between different forms of teaching, suitability of assignment work and class exercise, the validity of testing and examination procedures, and so on (Falk and Lee Dow, 1971b). It was central to the Melbourne approach that the lecturer should agree to the evaluation of his or her teaching by students, that the results were confidential and that a counselling follow-up took place.

The work of these units in promoting awareness among academic staff of what constitutes good teaching and effective learning has affected curriculum planning, course organisation, methods of assessment, educational measurement, and the evaluation of courses, students and teaching over the past decade. Their research output is listed and abstracted in Labyrinth, a clearinghouse bulletin produced by Queensland's Tertiary Education Institute, which provides a comprehensive coverage of Australian higher education research since 1976. In the nine issues so far published some 1,000 reports of field research done by units are reported.

In broad terms, up until the late 1960s, policy and practice were based on the assumption that a thorough knowledge of the discipline was the sole requirement for teaching at the tertiary level (Miller, 1976). This has now been replaced by a strong and growing commitment to in-service training for staff in higher institutions.[4]

A Symposium on Teacher Education for Tertiary Teachers (Miller, 1977) provides an overview of developments in this area and points to a shift in emphasis away from teaching skills towards a greater concentration on student learning. For instance,

in the field of educational technology:

> "... the emphasis has shifted from the provision of audio-visual aids to the teacher to assist his performance ... to the use of media by the learner to assist his learning (p. 48)".

The teacher is increasingly seen as a facilitator of learning rather than as an instructor. One example of this view is seen in programmes in which there is little or no didactic teaching; instead the learning strategy is to give students problems to solve with the aid of a variety of resources (Sheldrake, 1978). Brewer, who pioneered the audio-tutorial[5] in Australian higher institutions, has developed an innovative method of conducting a course using self-instructional modules and interactive small group discussion (known as SIMIG). The effectiveness of this instructional technique has been demonstrated using overall performance in final examinations (Brewer, 1974, 1977) and in individual problem questions in examinations (Brewer, 1979; Brewer and Tomlinson, 1981).

While lip-service has always been paid to the notion that the main purpose of teaching in higher education is to help students to learn independently and to develop critical thought, it is only in the last few years that developments in educational technology and particularly advances in knowledge about the nature of learning have allowed this objective to begin to be translated into practice (see Boud (1981), Developing Student Autonomy in Learning and Powell (1981a), 'Helping and Hindering Learning'). As Roe's (1975) study, Using and Misusing the Materials of Teaching and Learning indicates, the usual idea of developing independent learning and critical thinking in students had been to let them sink or swim amidst a bewildering and ever-increasing array of learning materials.

The 1966-1975 decade brought about an enlargement of the definition of teaching to take explicit account of content, intentions, objectives and, more recently, the process of learning - "every tertiary teacher now has to learn about the psychology of learning" (Sheldrake, 1978: 223). Strong research interest in student learning in its natural context as distinct from the laboratory setting began to emerge in the latter half of the 1970s, and will be touched upon later.

We have attempted only to provide a very broad outline of Australian research on teaching and learning at the tertiary level - the Australian contribution to research in this area is included in a chapter in the Handbook of Research on Teaching (Dunkin, 1983).

It is too early to assess the impact of the applied studies carried out by higher education units on teaching and learning in universities and colleges although a recent report commissioned by the TEC (Johnson, 1982) reaches highly favourable conclusions. On the other hand many of the respondents to our survey of senior education researchers and policy-makers referred to research on teaching as one of the gaps to be filled and only three nominated any studies of teaching as having had some impact in terms of theory, policy or practice.

Of course a proper evaluation of the impact of research on teaching is difficult because impact is not through the mechanical appreciation of published (or unpublished, which most are) findings, but rather via the subtle introduction of new ideas to the campus. The lecturers who take part in a research study on, say, teaching methods, are influenced not so much by the conclusions which may be reached but rather by the new perspectives which come from changing roles for a while.

Inequality of Particpation

One reason which was given for paying closer attention to the teaching and learning process was the widely held expectation that increased participation in higher education would produce a population which, when compared with former years, would be

far less homeogeneous in social background and less skilled in the ways of university and college study. More attention to teaching and assessment would be needed if these new students were to attain their full potential. Indeed the CAEs were required by the terms of their establishment to widen educational opportunity; and, concomitantly, to emphasise the teaching function (McLaren, 1974).

Although research continued to focus far more on students than on teaching methods, staff members and examinations, the orientation of these investigations underwent a transformation and, during the late '60s, studies of the social composition of the student population (hitherto something of a side issue in the question of performance and selection) which were explicitly concerned with equality of educational opportunity began to proliferate. There was a growing awareness that those most in need of the help which education could give were those who benefitted least. It also became a matter of concern that participation rates of various social groups were known only imprecisely.

The first ever national study of school leavers was undertaken by the Australian Council for Educational Research of children who left Australian schools in 1959-60 (Radford, 1962). A repeat study was made in 1971-72 (Radford and Wilkes, 1975). The results demonstrated how schools sifted students according to their social origins. The earlier study found that, of the 2 per cent of school leavers whose fathers were "university professional", 36 per cent of the boys and 24 per cent of the girls entered university. Of the 33 per cent of all school leavers with fathers in "unskilled and semi-skilled" occupations, only 1.5 per cent of the boys and 0.7 per cent of the girls made it to university (Radford, 1962).

This sharp social division was only slightly less in 1971-72. By then more of the sample were proceeding to university and participation of children from semi-skilled and unskilled homes had increased slightly, mainly among boys. In the same twelve-year period, the proportion of university students with professional backgrounds rose significantly, although overall the changes involved some lowering of the ratio of upper-class students to lower-class ones. Senior technical colleges or CAEs were closer to the population generally but were still well above the population average (Radford and Wilkes, 1975). There was a hierarchy of institutions: universities had the largest proportion of students from a high socio-economic background, then senior technical students and finally teachers college students. A number of other studies have shown that students in teacher education, compared with other students, were likely to be from lower status backgrounds (Bassett, 1958, 1961, 1963; Pike, 1966; McKevitt and Douglas, 1973). The recent cutback in recruitment to teacher education clearly has serious implications for the educational opportunities of less well-off students who had hitherto been able to take advantage of the financial benefits provided by State education department studentships.

Studies within particular States confirmed the ACER national account. Dunn, Fensham, Osman and Strong (1969) studied the decisions relating to tertiary education made by 6,000 Victorian senior high school boys in 1967 and their actual destination. In 1973 Fensham and Taft traced those of the 1967 sample who had entered the nine major Victorian tertiary institutions. Again, the middle class group was over-represented at the expense of the working class students, the former being more likely to attend university while the lower middle and working class groups tended to enter CAEs and teachers colleges (Fensham and Taft, 1973).

Similar studies in Western Australia by Dufty (1972) and in South Australia by Blandy and Goldsworthy (1975), confirmed that the higher the social status the greater the likelihood of continuing through the school system, entering higher education and attending a prestigious institution.

Comparisons between higher education students and their non-academic peers were made in a longitudinal study by Gilchrist and Hammond (1971). In 1957 a sample of 421 Melbourne primary school boys had been studied with a view to identifying social and psychological factors influencing educational achievement (Hammond and Cox, 1967). Ten years later those of the original sample who had entered university or equivalent courses at the Royal Melbourne Institute of Technology were compared with a group, also from the original sample, which tests had shown to be their intellectual equals but who had not undertaken high level study. As with the ACER studies, high

occupational status, having a father with a tertiary education and attendance at a non-Catholic private school all correlated strongly with entry to higher education. The level of educational aspiration which parents had for their children was also associated with SES and type of school attended (Gilchrist and Hammond, 1971).

Other studies in the 1970s of school leaving patterns and entry into the workforce or post-secondary education include the La Trobe 15 to 18 Year Project (Poole, 1978a, 1978b; Poole and Simpkin, 1976; Poole, Juchsowski and Jones, 1977), Meade's (1978) study in Sydney, and the ACER Australia-wide survey of a representative sample of some 5,000 individuals aged 17 years on 1 October 1978. The last, reported by Williams, Clancy, Batten and Girling-Butcher (1980) found that the decision to stay on at school or leave varied with State of residence, type of school attended, level of school achievement, sex, and various family characteristics.

Drawing on data from the annual surveys of new entrants to Melbourne University started in 1962 by the University's Education Research Office, Lee Dow, Jones and Osman (1972) presented a social profile of students entering in 1969 and 1970. They reported that despite the increase in school retention rates, the University continued to draw disproportionately from the upper socio-economic sectors. The proportion of females had increased through the 1960s in line with the higher proportions of girls completing secondary school, but although they consistently performed better than the boys in sixth-form examinations, fewer made the transition to university - "for every woman entering the University, there are two men" (Lee Dow et al., 1972: 79). The more prestigious professional faculties of medicine, law and of course engineering remained heavily dominated by males; females however accounted for 75 per cent of the Arts Faculty enrolments in 1970. Country students were also found to be significantly under-represented. Results of the Melbourne survey for later years were analysed as part of a national study which reported that "although some marginal trends are discernible, it is the fundamental lack of change which makes the overwhelming impression" (Anderson et al., 1978: 55).

Data comparable to that obtained by the Melbourne surveys have been gathered at Monash University by the Higher Education Advisory and Research Unit since 1970. Analysis of this data has been published by Ryan (1972), Smurthwaite (1974), and Slamowicz, Smurthwaite and West (1976) who looked at the years 1970 to 1975. The Monash social spectrum is close to Melbourne's, but a little more representative of the population generally and even more constant over time.

These surveys probably provide the most important single source of information concerning the social background of higher education students in Australia, particularly the Melbourne survey since its gives an almost unbroken supply of data covering almost 20 years. It provides a unique source for studying the effect changes during the '60s and '70s had on the composition of the student body. At least until the mid-1970s, there were no discernible trends in the social make-up of the student body in these two universities.

Only a few studies have examined the national scene. The social background of university students at six universities was gathered in the course of a longitudinal study of professional socialisation by Anderson and Western (1969, 1970). The study aimed to discover how attitudes and values changed as students progressed through professional training and the extent to which their outlook approached that characteristic of their profession. Surveys were made of entrants to engineering and law in 1965, and to medicine and teacher education in 1967. Students in all four courses were on aveage from higher status backgrounds than young people generally; medicine and law were least representative, teaching was closest to the average. Faculty or course was more important than university or location in explaining differences in both background and values: students in a particular faculty were closer to students in the same faculty elsewhere than they were to other students in their own university. Apparently different professions attract different sorts of persons, socially and psychologically.

Because the CAE system was developed to meet the needs not being met by the universities, and to cater for students with "practical minds" research questions were asked about the origins of students entering the new system.

Horne and Wise (1970) collected information on the social background of some 4,000 first year students enrolled in business studies and engineering courses in Australian CAEs in 1969. They found that while fewer college students than university students had fathers in a professional or administrative occupation, the proportion that did so was still far greater than that in the corresponding age group in the general population; the families of college students were also less likely than those of their university counterparts to have had previous experience of tertiary education (Horne, 1970).

Maddox (1970) examined the social background of 803 students entering applied science courses in CAEs in 1969; 255 university science students were included for comparison. He reported that full-time university students had the highest socio-economic standing, then part-time university students, followed by full-time college students, with part-time college students having the lowest standing. Comparing his results with those of the 1959-1960 ACER school leaver study, Maddox concluded that, if anything, the representation of children of manual workers among higher education students had declined rather than increased. A comparison of large metropolitan CAEs with universities also showed that differences in socio-economic background between students at the two types of institutions were far less significant than the differences between the socio-economic status of either student body and that of the population generally (Maddox, 1970).

These early studies of the social profiles of the university and CAE student bodies were confirmed in an Australia-wide study of students costs and incomes made by the Australian Department of Education and the Australian Union of Students in 1974. The sample represented 3 per cent of higher education student population: 4,456 students of whom approximately three-quarters were studying full-time. Once again professional groups were over-represented and manual workers under-represented, especially in the case of university students. Fathers of university students tended to earn more than fathers of CAE students, and this was also true of fathers of full-time students compared with fathers of part-time students generally (Australian Department of Education, 1975).

As part of the Regional Colleges study (Anderson et al., 1975) Beswick studied the background and educational choices of a carefully structured sample of some 2,000 CAE students and 5,000 matriculation students in 1973 and subsequent years. Rather surprisingly, it was found that family social background, which was important in determining who completed school, was not associated with transition from Year 12 to higher education; it did, however, appear to influence whether a student entered university or a CAE. Attitudes of family (or friends) towards higher education were found to be of considerable importance - after examination results, the most important factor predicting enrolment in a tertiary institution was the students' reports of their parents' wishes for them to continue their formal education. Beswick reported little evidence of family discrimination against girls at the point of entry to tertiary education (Beswick, 1975). One of the most important findings of the main study, which aimed at presenting a complete description of all aspects of regional colleges, was that the presence of a college in a region encouraged local young people to study at a more advanced level than they would have had higher education not been locally available to them.

Whether the abolition of fees had changed the social composition of students in higher education became the subject of an investigation commissioned by the AVCC. All new students in all universities and a large number of CAEs were surveyed in order to obtain information on background and opinion on the effect of costs on enrolment decisions. A picture of the social composition of the higher education student population in 1976-77 reflects the findings of earlier studies:

> "Within higher education the social composition varies with type of institution, type of enrolment and metropolitan or country location. The order, from highest to lowest on the composite SES index is: university full-time, university part-time, metropolitan CAE full-time, metropolitan CAE part-time and country CAE. A similar order is obtained if the indicator is secondary education at a non-Catholic independent school ...

> The conclusion must be that the effect of fee abolition on the social composition of students in higher education is small although large numbers of individuals are affected by the presence or absence of fees and those who are so affected are disproportionately from the lower SES and other under-represented groups (i.e. part-time students, women, older students and country residents)" (Anderson, Boven, Fensham and Powell, 1978: 195, 197).

The study used a model connecting the contribution of environment and inherited ability to the probability of entry to higher education. The model proposes that, while basic ability influences level of achievement, environmental circumstances influence ability, aspiration and accessibility as well as achievement. Improvements in the availability of higher education, through the removal of financial barriers to access like tuition fees, are a necessary but not a sufficient condition for democratising participation. Family circumstances which depress scholastic achievement, cause withdrawal or keep aspirations low require policies at the secondary school level. Abolition of fees helps those who get to the starting-gate; most of the poor do not get that far.

Minority Groups

The above studies documented beyond any reasonable doubt that higher education served the needs of the rich more than the poor. Research then began to sharpen its focus and from 1970 onwards we find many more studies asking questions about sub-sections of the population whose participation was low. For instance, the relatively low rate of participation and widespread under-achievement by women has received considerable attention and was the specific concern of Keeves and Read (1976), the Study Group of the Schools Commission (1975) and the Victorian Committe on Equal Opportunity in Schools (1977). Other studies have highlighted the extent to which country students lag behind city students in terms of educational achievement and participation at higher levels (e.g. Verco and Whiteman (1970) in New South Wales and Fyfield (1970) in Victoria); the subject has also been investigated in a series of studies commissioned by the Commission of Inquiry into Poverty (1976). More recent contributions include the studies by Elsworth, Day, Hurworth and Andrews (1982), Stoessiger (1980) and Turney, Sinclair and Cairns (1980).

The educational aspirations and participation in higher education of students of migrant background have been examined in a series of Victorian studies which were largely the work of Ronald Taft (Taft, Strong and Fensham, 1971; Taft, 1975a, 1975b). Information on this topic has also been provided by E. Isaacs (1981), Martin and Meade (1979), Mitchell (1976), Smolicz and Wiseman (1971a, 1971b), Turney, Inglis, Sinclair and Straton (1978). The overall conclusion appears to be that although many students of migrant background, particularly those from Eastern European countries, have high aspirations in comparison with Australian students - especially those of working class origin - these aspirations are frequently not realised because of difficulties experienced by migrants, notably those arising from a limited knowledge of English. The more recent studies (e.g. Elsworth et al., 1982) indicate that migrants now "over-participate".

The problems experienced by Aborigines also began to receive wide attention in the late 1960s. In a study of the Secondary Grants Scheme, Watts (1976) found that 4.9 per cent of Aboriginal children reached senior secondary classes, while the Commission of Enquiry into Poverty (1976) reported that the proportion of the Aboriginal population which proceeded beyond Year 10 was only one-sixth of that of the majority culture. Other significant studies which discuss the very low rate of participation and achievement by Aborigines in any sort of education are those by Biddle and Smith (1970), Dawson (1970), Beasley (1970), Watts (1981), Gale (1972), Sommerlad (1972), Smith and Biddle (1975), Binnion (1976) and Willmott (1978). In these studies educational disadvantage among Aborigines is considered - as it should be - as part of wider social and cultural conflicts.

Overseas students also attracted the attention of research workers during this period. In 1973 the Education Research Unit at the Australian National University made a nation-wide study of students from developing countries which focused on adaptation to Australian conditions and on the phenomenon of international "brain drain" (Rao, 1976). Rao found that, like Australian students, the large majority of overseas students are from the urban middle classes, and overall about three-quarters are private rather than sponsored students. On this point Rao concludes that

> "... a poor student from a developing country is unlikely to be able to take advantage of Australia's educational opportunities, no matter how scholastically brilliant, unless he succeeds in gaining his own government's nomination for a Colombo Plan scholarship. The rigid application of requirements for issuing entry permits, particularly the high educational standards and adequate knowledge of English required from students, has been indirectly favouring students from urban middle class groups because of the association between social class and educational achievement (p. 212)".

Other studies of the problems experienced by overseas students include those by Keats (1970, 1972a, 1972b), Hodgkin (1966, 1968, 1969) and McAdam (1972). Of all the problems encountered, difficulties with the English language head the list.

The concern for equity in access to higher education which developed during the late 1960s has continued to the present time. A review of reports on the composition of the Australian student body over the last forty years concludes that:

> "Despite all the social idealism attached to education in the last decade, the hope that education would lead us to the threshold of a just society in which inequalities due to personal background and circumstances have been eliminated, higher education remains as much as ever the domain of those in least need of the greater personal opportunity and self-realisation it commonly brings" (Anderson and Vervoorn, 1982).

ACCOUNTABILITY AND DECLINE: 1976-1981

Growth ended in 1975. Thereafter it became fashionable to refer to higher education as being in a "steady state". The term is misleading because there have been changes since 1975. There has been a real decline in resources available to higher education, a downturn in the number of school leavers continuing on to university and college, a drastic reduction in the recruitment of new staff (which had led to an ageing of academic staff), major surgery on the college system with many forced amalgamations, and more direct intervention by the Federal Government, for example, in issuing guidelines to the TEC. The changed climate is reflected in the title of books published in the last four years: The Future of Higher Education in Australia (Hore, Linke and West (eds.), 1978), Higher Education in a Steady State (Powell (ed.), 1978a), Accountability in Higher Education (Sheldrake and Linke (eds.), 1979), Academia Becalmed (Harman, Miller, Bennett and Anderson (eds.), 1980), Freedom and Control (Miller (ed.), 1980a), The End of a Golden Age (Gross and Western (eds.), 1981), A Time of Troubles (Anwyl and Harman (eds.), 1982) and Federal Intervention (Harman and Smart (eds.), 1982). Compare these with some of the cheerful titles of earlier decades: Promise and Performance, If the Gown Fits, The University and its Community, The University Experience.

Three events contributed to the problems of higher education. First there was the economic downturn with rising inflation and unemployment starting in the mid-1970s, which led governments to reduce expenditure in the public sector. Education, particularly higher education, received special attention. Although government probably needed no convincing, the human capital theories which had been used to justify expansion in the 1950s and 1960s were being discredited in the 1970s. A further probable effect of the changed economic climate was the downturn in participation in higher education by young people, particularly young males.[6] This is generally attributed to anxiety about graduate employment causing bright school leavers to take a job-in-hand rather than face several more years study and uncertain employment thereafter.

The second event, quite independent of the economic downturn but coincident with it, was the sharp decline in the birthrate to which, together with there being fewer women of childbearing age as the post-war baby boom generation matured, meant fewer children for the schools in the 1980s and therefore the need for fewer teachers. These demographic facts plus a sharp reduction in teacher resignations led to directives from 1976 on for drastic reductions in recruitment into teacher education. (Here is an instance of research results being known for some years but not acted on since it was not deemed politically expedient to slash teacher education in the early 1970s, and of course institutions were reluctant to act on themselves.) Seventeen of the nineteen universities and about half of the CAEs had teacher education programmes and were affected directly; arts, science and economics faculties also felt the effects since significant proportions of their graduates had formerly found employment in teacher education.

Finally, anti-academic and anti-intellectual sentiments, always present to an extent in the community and in government, have been stronger than usual in the past half dozen years and have made it easy for governments to act negatively on higher education. To quote from an article in The Bulletin (12 March 1977) entitled "The Scandal of Our Universities": "The tertiary education system has grown so fat, so fast, that academia has become an enormous island of privilege, populated in considerable measure by drones and parasites". As well as reducing resources, government is insistent on more stringent accountability and is inclined to intervention in the academic affairs of particular universities. The result, according to Western and Gross (1981: 4) has been action that is "substantial, sudden, unplanned, unanticipated and [according to media reports of the newly returned Liberal Government's attitude towards higher education, particularly the universities] in significant respects stemming from motives which can best be described as vindictive".

Quite apart from the economic and demographic downturns, and the unfavourable attitudes, higher education was due to trim its sails anyway. The rate of expansion

of the 1950s and 1960s could not have been sustained. Had those rates continued, before too many decades everyone would have been enrolled in degree studies and most of the GNP would have been needed to support them. Because the universities and CAEs had become accustomed to regular increases in budgets, innovations by increment were the order of the day. Part of the present pain is caused by the necessity to make changes by shifting resources from established programmes; there is, however, also a real decline in unit funding.

Utilitarian values were to the fore in one of the present Government's first education initiatives which was to set up the Commonwealth Committee of Inquiry into Education and Training in 1976 under the chairmanship of Professor Bruce Williams. The terms of reference stressed, in a way which those given to the Martin Committee (1964) did not, the relationship between manpower needs and educational provision (Cowen, 1981). The Commonwealth Government's preoccupation with accountability in terms of placing pressure on the system to produce the ever-elusive "right number" of graduates of the "right kind" had fundamental implications for higher education. The Williams Report, published in 1979, confirmed that the growth enjoyed by the education system during the past two decades was over, partly as a result of economic recession, partly because of demographic factors. As West points out in his analysis of the Report: "University education in this country is no longer demand driven. It is no longer accepted that, provided there are students who want, and are able to, undertake university education, the government will provide finance for them" (West, 1979: 2).

In response to the clause in his brief that requested consideration of "manpower forecasts and their applicability to educational planning" Williams surveyed manpower planning in Australia and found the results "very chastening - for those who advocated more manpower planning ..." (Williams, 1979b: 41).

The Tertiary Education Commission (now the Commonwealth Tertiary Education Commission) has also been expected to provide on-going advice on "the relationship of manpower supply to demand in areas which are critical for educational planning" (TEC, 1981: I, 1, 97). Like the Williams Committee, the Commission has expressed strong reservations about using manpower forecasts as a basis for educational policy:

> "Reliable projections of long-term trends are necessarily elusive ... For example, in the past 7 or 8 years, expert projections of the population have been revised significantly downwards and then restored close to the original levels ... The forecasting of manpower involves a capacity to predict demographic trends, the state of the economy, changes in technology, and even [sic] political decisions. Moreover, lack of adequate statistical information on the composition of, and movements within, the labour market hinders analysis of manpower trends (p.98)".

These words of caution should be borne in mind when we are told that the rationalisation of higher education is basically the result of clear economic and demographic trends which are resulting in a much reduced need for graduates in general and for specific kinds of graduates in particular. Demographic trends can never be clear and indisputable except in the short-term, and to be effective educational planning must be based on long term trends. And even if the population forecasts could be assumed to be entirely accurate, Borrie has emphasised the fact that "the trend from here to the end of the century is not all decline, but variations between growth and decline - patterns which make forward educational planning (whether for physical equipment or for teacher supply) extremely difficult" (Borrie, 1980: 106).

In its latest report, the TEC (1981) has nicely illustrated the dangers inherent in placing undue importance on current reduced need of particular types of graduates. It recalls that several years ago unemployment and under-employment among new engineering graduates had led to calls from industry (and from at least one of the major State committees of inquiry in post-secondary education) for first a decline and then, only three or four years ago, the continued decline in engineering enrolments. Now, when students who began engineering courses when these views were

being expressed are graduating, demand for their services is high and the shortage of professional engineers is receiving considerable publicity (TEC, 1981: I, 1, 98).

The Decline of Teacher Education

The need to rationalise post-secondary education, particularly since the foreseen oversupply of teachers would have implications for teacher education enrolments, had been felt at the State as well as at the federal level, and by 1977 all States except Queensland had decided to seek expert advice on their systems of post-secondary education.

Comprehensive State enquiries were carried out in Western Australia (Partridge, 1976), Tasmania (Karmel, 1976), Victoria (Partridge, 1978) and South Australia (Anderson, 1979). To avoid worsening the oversupply of teachers, these enquiries recommended reductions in the scale of teacher education and consolidations of institutions.

In 1976, the same year in which the Government required universities to stabilise their intakes up to 1979 at the 1976 level and CAEs to similarly curb enrolments, the stabilisation of enrolments in pre-service teacher education was specifically recommended because of the imminent oversupply of teachers. Analyses of teacher supply and demand have been prepared in every State over the past three years, as well as for Australia as a whole, and processes of regular review and updating of these analyses have been established (TEC, 1981).

The National Inquiry into Teacher Education submitted its report (Auchmuty Report) in 1980 and recommended a number of reforms, some of which implied increased enrolments in teacher education. In advising the Minister on the Report, the TEC "conscious of the funding constraints" has stated:

> "If implemented, the recommendations will result in levels of enrolments in pre-service and post-experience teacher education higher than will otherwise be the case ... The Report may encourage State authorities and other interested parties to plead for delay in implementing plans for the reallocation of resources in higher education from teacher education to such fields as commerce, computing, applied science and technology (p. 24)".

Coupled with the falling value of the Tertiary Education Assistance Scheme (TEAS), the contraction of places in teacher education has serious implications for the social composition of the higher education student population. Although there appears to have been no obvious change in the social composition of students in higher education since the abolition of fees and the introduction of TEAS,[7] it must be remembered that these initiatives coincided with the beginning of a decline in the number of studentships awarded. At their peak these schemes provided assistance to more than 50,000 studentship holders in universities and CAEs, almost as many as the number of students now on TEAS; today there are perhaps 3,000. Given that the teaching profession and teaching studentships have been responsible for bringing marginal groups into higher education, the decline in opportunity to become a teacher and the demise of the studentship scheme must have had substantial effects.

McLaren (1979), in a discussion of the Williams Report recommendations for a further decline in enrolments in teacher education, raises a related issue:

> "A substantial weakness in the Report is its failure to consider the social consequences of developments which it recommends or anticipates. For example it makes no attempt to estimate the effect on teaching which may follow from restricting the intake and thereby narrowing

the social base of the profession. One of the effects may be to increase those failures in the education system, such as meeting the needs of the poor, of migrants or of Aboriginals, which the Report elsewhere deplores (p. 14)".

Co-ordination

During the late 1970s there was an acceleration in the movement, which had started more than thirty years earlier during World War II, for authority to be centralised. This movement has been from institutions to government, from State to Commonwealth, from statutory authority to Minister. We have seen in earlier sections of this account how the Commonwealth assumed partial and then full responsibility for higher education, and how in 1974 universities relinquished charging for tuition, which had been their only substantial independent source of income. As well as providing income the Commonwealth established commissions to co-ordinate the balanced development of higher education. At the State level, not all of the recommendations made by the various Committees of Inquiry were enacted, but those for the establishment of co-ordinating authorities were. By 1981 all States had established such authorities (TEC, 1981: I, 1, pp. 16-18).

In the meantime, at the federal level, co-ordination was extended with the merging of the separate Universities, Advanced Education and Technical and Further Education Commissions (now Councils) into a new Tertiary Education Commission in 1977. The move of authority to the centre advanced another step in 1976 when the Federal Government introduced (temporarily as it turned out) a "rolling triennium" to replace three-year budgets, and instituted funding guidelines to which the TEC had to accommodate its recommendations. The most recent and clearest demonstration of where authority resides was provided in 1981 when the Prime Minister announced his Government's decisions on the recommendations which had been made with respect to the Review of Commonwealth Functions (Lynch, 1981). In the higher education area funding for thirty teacher education CAEs would be stopped unless amalgamations took place, four engineering schools were to be closed, Murdoch University and the University of Western Australia were to effect "greater sharing and collaboration", a loans scheme for students was to be introduced, eligibility for TEAS grants was to be tightened, tuition fees were to be charged for students undertaking second and higher qualifications, the TEC was to apply maximum expenditure constraints and the Government itself would promote rationalisation and consolidation. Grant Harman, in a chapter analysing the "Razor Gang" moves, points out that not all such policy recommendations stick (Harman, 1982a). In the present case, however, most of the recommendations seem to have been effected, a notable exception being tuition fees for second and higher qualification legislation which has been blocked by the Senate.

Institutional Reactions

Cutbacks in funds have forced universities and CAEs to reduce expenditure on academic staff. Institutions have had recourse to such measures as not filling posts which fall vacant, introducing more fixed-term appointments, avoiding the granting of tenure, and reducing tutorial staff.

Demands that universities and CAEs be accountable in terms of being "responsive to changes in student preferences and community attitudes" (TEC, 1981: I, 1, 229) are increasing at a time when diminishing, tightly controlled budgets and reduced staff levels and turnover are severely inhibiting the system's capacity to diversify and cater for such changes; as the TEC reports, "institutions have been unable to fund academic staff to support new developments" (TEC, 1981: I, 1, p. 230).

There are other effects to consider. Some years ago Powell (1978b) looked at the

possible implications of the steady state for universities as sources of social criticism and predicted that:

> "As the academic marketplace becomes increasingly restricted and a growing proportion of appointments is made on a contract basis, concern for the future may persuade many staff that it would be unwise to give voice to anti-establishment opinions ... The strongly anti-intellectual orientation of Australian society may take on increased significance during a period of general economic retrenchment in that many of the non-utilitarian values associated with universities may be seen as expensive frills which need to be cut down to size (pp. 150-51)".

Given current scepticism about the economic returns of higher education, together with the Government's preoccupation with the economic rather than social contribution of higher education, the cost of rejecting someone who would have graduated - now more than ever before a private and social cost - is likely to be judged the lesser of two evils.

On the subject of using cost-benefit analysis, Thomas points out that, in view of the increasing dependence of the tertiary education system on national politics and political pressure proceeding from the "ballot-box reflexes" to produce short-term results of political initiatives, "serious disruption can be caused to programmes which have a timetable for development and implementation in excess of the usual electoral cycle" (Thomas, 1978: 261).

Since our education commissions now operate much more than formerly as agencies of government and work within policy guidelines determined by those governments, Parry has stressed the need for an Australian equivalent of America's Carnegie Council to provide an independent national agency "which could take a visionary look at where Australia is heading in education in the long term" (Parry, 1979: 14). In Dunn's (1979) view:

> "... the major educational policy decisions are only marginally influenced by research and developments. Very often the decision is made and selective research data are used to legitimise the decision. Alternatively evaluations are carried out with data selectively gathered to justify policy (p. 23)".

Policy research has been elevated to a high priority area in America and there are signs that Australia may follow suit.

However the possibility of educational research fulfilling its proper role in policy-making (see Educational Policy Making in Australia, Shellard (ed.), 1979), has been further reduced over recent years. The South Australian Council for Educational Research and Planning, a promising development in this area, was disbanded only a few years after its inception in 1975, and the Education Research Unit of the Australian National University was wound up in 1979. More recently, following recommendations of the Committee of Review of Commonwealth Functions, the so-called "Razor Gang" (Lynch, 1981) the Education Research and Development Committee (ERDC) was abolished and the Curriculum Development Centre (CDC) almost met with the same fate; strong opposition to the dismantling of the CDC prevented this from happening, but staff and funding levels have been reduced and the Centre, renamed the Curriculum Development Unit, is now under the authority of the Commonwealth Education Department. The higher education research and development units have also suffered from reduced financial support; units at Flinders, Newcastle, New England and Tasmania have been disbanded during the last few years, and several others have suffered cutbacks in staffing. Although the Williams Committee had recommended that "teaching-and-research " units be established at all universities and CAEs, the TEC made it clear that if new units are to be established they will have to be financed within existing resources of the institution concerned (TEC, 1981: I, 5, p. 106).

The role of these units is likely to become increasingly oriented towards evaluation, particularly the evaluation of teaching "efficiency" (Roe, 1980; Thomas, 1978). In the United States where such evaluations are commonly used in tenure/promotion decisions, the problems of estimating quality of teaching by the use of student evaluations have already received considerable attention from researchers (Marsh, 1981). Signs that institutionalised evaluation of teaching for promotion and tenure purposes will soon become widespread in Australia have begun to stimulate research interest in this area.[8]

Also, in the face of shrinking budgets, it has been noted that "heads of departments are seeking information to help them make difficult decisions - for example ... which members of the non-tenured staff should be offered another term" (Thomas, 1978: 258). It is not surprising that the 3-day pilot workshop in evaluative skills for senior staff (developed by Ernest Roe and Rod McDonald with funds from the TECs Evaluative Studies Program) was extremely well attended in May 1981. Whether units noted for their independent research will be able to avoid assuming the role of inspector remains to be seen, but initiatives like that taken by Roe and McDonald (1981) may help prevent it.

Research

'Crisis Management'

As we shall see, the current recession in higher education has helped to focus research attention once again on institutional efficiency and on student performance, particularly student "wastage". Another phenomenon coincident to the economic recession is the surge in enrolments by older students - the only area of growth since the early 1970s. Although the reasons for changes in enrolment patterns are not fully understood it seems plausible that anxiety about unemployment leads qualified school leavers to take a job-in-hand; and that the same economic climate causes older persons to upgrade their qualifications by part-time study. Furthermore, with the reduced supply of younger students, institutions are inclined to make up numbers by encouraging "mature age" enrolments. There has been a spate of research studies on these older students since the mid-1970s.

Another theme in recent research has, naturally enough, been concerned with institutional adaptation to declining resources. As Terry Hore (1978a: 3) wrote in his introduction to one of the first of such books to appear, "... if educational planners do not help in shaping the future, the scenario will be built primarily upon political expediences".

The major publications in this area have already been listed in our introduction to the 1976-1982 period - the main issues addressed include:

- the policy-making process at the State and federal levels (e.g. Birch, 1982; Chippendale, 1979; Gross, 1981; Hall and Willett, 1979; Harman, 1982b; Karmel, 1980; Parry, 1980a; Smart, 1982; Tomlinson, 1982).
- the future provision of teacher education in the face of reduced demand for school teachers (e.g. Birrell, 1978; Burke, 1981; Lucas, 1978; Shears, 1981).
- demographic trends and their implications (e.g. Birrell, 1978; Borrie, 1980; Burke and McKenzie, 1979; Karmel, 1980).
- the amalgamation process (e.g. Birt, 1981; Byers, 1981; Jevons, 1981; King, 1978; R. Selby Smith, 1980).
- the changing clientele of higher education (e.g. Hore, 1978b; G. Isaacs, 1981; King, 1978; Lucas, 1978; Mainsbridge, 1978; McDonell, 1978; Whitelock, 1978).
- institutional responses, concerning
  - (i) teaching and learning (e.g. Hore, 1978b; A. Miller, 1980b; Paget, 1978; Roe, 1980; Sheldrake, 1978)

(ii) staffing (e.g. Johnson, 1980; Karmel, 1980; King, 1978; Magin, 1978; Short, 1980; Spaull, 1978)

(iii) academic review and organisational flexibility (e.g. Burke and McKenzie, 1979; Harman and Johnson, 1979; Imrie and Murray, 1980; Low, 1980; Thomas, 1978)

- maintaining institutional autonomy (e.g. Fensham, 1981; Harman, 1981b; Parry, 1980b; Powell, 1978b; Ramsey and Howlett, 1979; Walker, 1980)
- possibilities for multi-level institutions (e.g. Harman, 1980, 1981; King, 1978; Ramsey, 1981; Walker, 1980)
- the role of higher education research in policy making (Dunn, 1978, 1979; Parry, 1979; B. Williams, 1979b).

Mature Age Students

During the 1970s, for reasons which are not yet entirely clear, the undergraduate population of higher education started to age.[9] The trend, evident in universities and CAEs, was not due to a demographic shift but resulted from both a decline in demand from young school leavers and an increase in demand from older people. The National Population Inquiry (Borrie, Smith and Dilulio, 1978: 31) showed that the 17-22 age group included only about 60 per cent of total enrolments in all higher education and that the increase in university participation rates after 1973 was primarily due to higher rates for older students. More recently, the TEC (1981) has drawn attention to a steady rise in part-time enrolments, predominantly of older students, and a declining demand for full-time study among school leavers for the period 1975 to 1980.

Naturally enough older students began to attract attention because they were an important source of numbers in a system where government income was related to enrolments. La Trobe University, in 1972, was probably the first to initiate special entry provisions for older unmatriculated entrants, and by late 1976 nearly all universities and colleges had some relaxed entry provisions for mature age students (West, Boon and Smurthwaite, 1980). Since older students were often not as well qualified as young entrants straight from school and therefore might not perform as well, there were numerous studies of their academic performance. The first national conference on mature age students was convened at Sydney University in August 1978, a four-day workshop, funded by ERDC, of researchers in this area was held at Monash University in December 1980 and a second national conference was held at the Darling Downs Institute of Advanced Education in 1981.

The nature and underlying causes of the influx of mature age students into higher education in relation to the implications for selection and admission policies, course content and organisation, teaching and student services have been the subject of major studies at Monash (Hore and West, 1980), Queensland University (Isaacs, 1979; Gough and Maddock, 1979); Murdoch (MacDonald and Knights, 1978 and 1981; Boud, Knights and MacDonald, 1980); the University of New South Wales (Barrett, 1976, 1980; Barrett and Powell, 1980); Caulfield Institute of Technology (Greagg, 1978, 1981) and Prahran SCV (Dickson, Killingsworth and Wilkinson, 1979).

However this list represents only a fraction of the effort - many more studies, particularly those on performance, are unpublished or have not been widely circulated. Surveys of the literature (Eaton, 1980; Eaton and West, 1980a; MacDonald and Knights, 1979) have established that mature age students, irrespective of the way they are admitted, tend to gain high marks, have excellent pass rates and about the same attrition rate as young students entering direct from school.

The relative success of mature age students in their studies may be due to their inclination to choose social science and arts courses. Most reports show concentration of mature age students in arts type courses with few taking science subjects. This may reflect a belief that a break in schooling leads to a loss in scientific and mathematical skills
age and experience, making maturity a predictor of success in humanities and the social sciences, the limited evidence available suggests that mathematical and scientific skills may suffer as a result of a break in study, though only temporarily.

Murdoch University, where the majority of new students are not direct from school, offers refresher courses for those people whose mathematical and scientific skills have deteriorated through disuse (Mainsbridge, 1978).

One conclusion from these studies is the inappropriateness of applying traditional admission criteria when selecting mature age students. HSC scores or standardised admission tests, when correlated with university performance, show a significantly lower association for mature age entrants than for young students straight from school (Eaton, 1980; Van Helden, 1975). Recognising this, many universities and colleges have developed special means for assessing mature age students, ranging from the completion of a reduced HSC requirement to overcoming a series of "motivational hurdles" intended in part to promote self-selection (for example, attendance at meetings or submission of an essay). The special entry scheme for unmatriculated mature age students introduced at the University of Queensland in 1977 admitted some 480 older applicants to the Arts Faculty almost solely on the basis of their strongly expressed desire to undertake university studies. Although over half of the special entry age group had not gone beyond the compulsory years of secondary school, their first year performance was equal to that of young matriculants entering straight from school (Isaacs, 1979). Similarly, the University of New South Wales, which also admits large numbers of unmatriculated mature age students, places the emphasis on motivation by requiring special entry applicants to attend a series of meetings and complete a piece of written work (Barrett and Powell, 1980).

Selection methods such as these are based on the research evidence relating to performance which strongly suggests that, given an average intelligence, the crucial factor for success in higher education is motivation and not necessarily prior experience in certain subjects. A recent study at the Australian National University has shown that older students tend to be far more intrinsically motivated and committed to their studies than the "normal age" students and concludes that the recent school leavers are far more in need of pre-entry counselling and assistance in making the transition to tertiary study than their mature age and often less qualified counterparts (Watkins, in press). The results of research at other Australian universities support this view - older students appear to be more interested in the subjects they are studying and less narrowly concerned with their vocational relevance than are young school leavers who, being more likely to fall into university study without much interest in the courses they enrol for, are more susceptible to motivational problems.

It seems that the need to keep up numbers which initially prompted universities and colleges to accept more mature age students has been replaced by a positive commitment due to their success (West, Boon and Smurthwaite, 1980). A study of academic staff attitudes towards mature age students at Monash University (Boon, 1980) revealed strong support for their admission and indicated that full HSC is no longer regarded by the majority as an essential entrance qualification for older entrants. Boon concludes: "The fact that a wide range of procedures other than HSC was favoured not only indicates that some alternative methods are preferred but also testifies to staff's recognition of the academic value of mature age students' experiences" (p.136).

Whether the extraordinary growth rate of mature age enrolments will continue has obvious importance for government and institutional policy decisions. In a study at Monash which went far beyond the issues of selection and performance, West and Hore (1978) developed a theoretical framework to help answer this question; the phenomenon in Australia in general and at Monash in particular is viewed in the light of changes within, and complex interactions between, the economic system (especially the employment market), the general community (for example, changing attitudes and values as reflected, for instance, in increased participation by women) and the higher education system itself. This study began at a time when very little was known about the phenomenon; when the investigation began in 1976, the only Australian research on the topic was Greagg's (1974) Master of Education thesis.

Commencing students at Monash aged 25 and over divided into three groups: those with previous experience of tertiary education, 43 per cent (35 per cent had already gained a tertiary qualification); early school leavers, 42 per cent; and students who enrolled after having deferred entry, 15 per cent. (The deferring group was not included in the case study, although Eaton and West (1980b: 5) reported evidence from

Europe which suggests that the recent decline in tertiary participation by the 17-20 age group may be a postponement rather than a rejection of higher education. As far as we are aware, the only studies of deferring students are small-scale investigations carried out at the University of New South Wales (Pearson, 1977; Weaving, 1978) and at the University of New England (Watkins, 1977a).

The Monash study suggests that there are two distinctive groups of older people entering higher education, and that each represents a reservoir of potential students. The first comprise people seeking re-certification or re-qualification. The second are those who missed out on qualifying for higher education when they were young either because of its cost, family attitudes or their own lack of interest. The latter group appears now to be motivated by a need for fulfilment and intellectual stimulation not provided by their present occupation. It is likely that demand from this group will continue - in Victoria, for example, there are an estimated 155,000 persons between the ages of 20 and 35 who have not completed secondary schooling but who are the intellectual equals of those who are presently doing so. The recertification group is currently dominated by teachers, nurses and librarians, areas where pressures to update qualifications are strong; but these pressures are beginning to occur in other occupations and with the need to retrain, as some jobs disappear and others emerge, this area of demand seems likely to continue. As in the Queensland study (Isaacs, 1979), people in this category were also found to want intellectual stimulation and development (West, 1980).

To sum up, the research suggests that the trend for increased participation by mature age students will continue and that they will perform well. However, the re-introduction of tuition fees for second tertiary qualifications was not anticipated when the Monash study was undertaken, although an attempt was made to assess the effect of their absence. Consistent with the national study of Anderson et al. (1978), mature age entrants at Monash would have been far less likely to attend than younger students had there been tuition fees. It seems probable that if fees are re-introduced, mature age student enrolments will fall.

In an earlier section we reported that the many studies of parental background revealed an undergraduate social mix distinctly unrepresentative of the general population; and furthermore that there was little evidence of change over the years. However, the last three studies mentioned all probed social origins and all found that the older students are on average closer than young students to the population at large. Thus if the trend to older enrolment continues, and other conditions such as costs and entrance hurdles do not change, we may expect to see before too long studies reporting democratisation of participation in higher education.

Student Dropout

Declining enrolment rates, reduced budgets and demands for accountability have produced renewed interest in student performance and wastage (Hall and Harper, 1981; Malley, 1981; West, 1978). The list of research topics is reminiscent of that reported for the first post-war decade in Part I of this review. Then there was also an interest in efficiency and manpower studies; the difference, however, is that whereas in the 1940s and 1950s growth was promoted because higher education was seen as a means of advancing national purposes, now its efficiency and manpower relevance are seen as means of effecting economies. For instance, institutional concern over student "wastage" has prompted nation-wide comparative studies of the effects of students' early experiences in universities (Williams and Pepe, 1982) and CAEs (C. Williams, in progress) on academic performance and withdrawal rates. Also, in response to the Williams Committee's call for further studies on student performance, working parties to investigate graduation and wastage rates (explicitly identified in the Williams Report (1979: 809) as a measure of institutional efficiency), have been set up by both the AVCC and the principals of colleges of advanced education.

In the first half of the 1970s a new aspect of student wastage began to emerge, namely a substantial increase in the number of academically successful students choosing to opt out of courses (Anderson and Western, 1975; Hayes, 1974, 1977; Sheldrake, 1976; Star, 1973; Watkins, 1977b). A pilot study of voluntary withdrawal at Monash University in 1975 (McInnis and Thomas, 1976) was prompted by the Committee of Deans, concerned by figures indicating that the number of "successful" dropouts

had more than doubled since 1970. Initially it seemed that the increase in voluntary withdrawal rates was perhaps another manifestation of that disaffection with higher education so dramatically expressed by the student power movement of the late 1960s and early 1970s where the term "dopout" originated.

The same trend, albeit more widespread, had already been observed in Canada and the USA and attracted considerable attention among educational researchers. Tinto's (1975) theoretical synthesis of the literature on dropout from higher education and studies by Cope and Hannah (1975) in North America and Entwistle and Wilson (1977) in the U.K. have been influential in extending the scope of Australian research on performance and wastage, particularly in terms of defining the nature of student dropout behaviour and taking more careful account of the institutional factors involved.

Until the mid-1970s few Australian studies related to student wastage made a distinction between those who discontinue because of academic failure and those who withdraw voluntarily. A three-year investigation of the latter group carried out by Hayes (1971, 1974, 1977) at the University of New South Wales provides the first published evidence on the nature of the phenomenon. By the end of the decade studies of factors associated with different types of withdrawal had been carried out in most Australian universities.[10]

Unlike the studies of the immediate post-war period, recent research on student dropout uses an interactionist perspective which began to appear in investigations of performance and attempts to improve student learning around the mid-1960s (e.g. Gibbs, 1966; Katz, Katz and Olphert, 1965; Pentony, 1968). In breaking with the theory that the indicators of future university performance are encapsulated in the beginning student and, instead, assuming that performance is the outcome of an interaction of the person and the environment, attention is directed to potentially handicapping circumstances such as financial aid, and to teaching and learning methods.

The process which leads students eventually to withdraw, either voluntarily or because of failure, is now recognised as involving highly complex interactions between the individual and the institution. Models designed to explain this process, and aid the development of appropriate intervention strategies, have been devised by Tinto (1975), Entwistle and Wilson (1977) and Hore, Lawler and West (1980).

Using the interactionist approach, the studies of different types of withdrawal have included institution-based variables, as well as the familiar student based ones (e.g. sex, age, entry qualifications, SES, measures of student commitment/motivation). However virtually the sole source of information about institutional factors which may relate to withdrawal come from students' perceptions of the academic and social environment (e.g. Baumgart and Johnstone, 1977; Hayes, 1977; Lewandowski, Powell and White, 1977; Rump and Greet, 1975; Watkins, 1982; Williams and Ainsworth, 1977; Williams and Pepe, 1982); staff characteristics and attitudes, an important subject of study in its own right, have been largely neglected.[11] Only in the last few years have studies of staff begun to emerge which contribute something to our understanding of how staff/student interaction may affect student adjustment (e.g. Boon, 1980; Bowden and Anwyl, 1980; Cannon, 1982; Genn, 1981; Watkins and Morstain, 1980; Watkins, 1981; Wieneke, 1981).

The continuing Student Progress and Performance Study (SPPS) at the ANU, established in 1976 by the Office for Research in Academic Methods and the Student Counselling Centre, aims at providing policy-relevant information and so pays particular attention to students' reactions to the university environment. Undergraduate withdrawal was the subject of the first reports arising from this study (Bennett and Mortimore, 1977a, 1977b). The ANU investigation is important in that it provides a comprehensive longitudinal picture of successive entry cohorts in terms of the relationship between their motivations, occupational and other circumstances, academic progress and performance, and destinations. However, as with so much institutional research, analysis of the SPPS data have yet to be published, although numerous reports have been circulated within the ANU since the study began.

Generalisations from the research findings on student dropout are not yet possible.

A source of confusion has been the variation in definition of the population under investigation - for instance some studies include students who withdraw in first year as well as those who completed that year but failed to re-enrol, some concentrate on first year, some deal with all students who discontinue regardless of year of enrolment, and others investigate withdrawal among special entry students. Another problem is bias in the samples. For instance Spady (1970), reviewing the American literature on attrition hypothesised that findings reflect the selective response rates of the samples used; these over-represent the more successful, higher status, or high ability respondents who co-operate more readily. Furthermore, as Hore, Lawler and West (1980: 9) point out, "experimental sampling studies, even if able to gain a representative sample, weighted correctly for those groups who fail to respond to questionnaires, must base their data on students' self-reported reasons for dropping-out, and must deal with the possibility of rationalisation of motives".

Also, because investigations of the phenomenon have usually been confined to single institutions, we know very little about the real extent of student wastage. Few Australian studies have investigated whether withdrawal is temporary or permanent. A study of all 1978 first-year entrants to the University of Newcastle (Maddox, 1979) who either completed the year but did not re-enrol or who withdrew during the academic year found that 44 per cent had transferred to other institutions. Davis (1974) followed up student dropouts from the sample used in the study of professional socialisation (described earlier) and found that many resumed studies at other institutions. Numerous investigations surveying withdrawing students' intentions about returning to study also support the "revolving door" phenomenon reported by Cope and Hannah (1975). However the fact that such a large proportion of withdrawing students report an intention to resume studies may be a function of that sampling bias mentioned earlier. As Malley (1981) suggests, our knowledge of the nature and extent of student wastage would be much improved by a system-wide synthesis of the data on students' destinations following withdrawal, and also agreement on definitions of the terms "dropout", attrition and wastage.

Despite these limitations, the recent research on student dropout has promoted forms of intervention designed to facilitate student adjustment - for instance, orientation programmes, counselling services, careers advisory centres, learning assistance programmes and, more recently, diagnostic tests, remedial programmes and pastoral care through "general tutors". It has also played some part in changing the approach to improving student learning. Motivation and study problems rather than intellectual inadequacy are assumed to be the important student-related influence on failure, dropout and underachievement. This perspective has contributed to a change in the nature of study skills programmes (Hore, Lawler and West, 1980). The traditional skills approach - typified in "how to study" books - was based on the assumption that there is a right way to study which suits all students in all situations. This approach is being replaced by emphasis on improving motivation and helping students to identify and develop a learning strategy appropriate for them and the subject being studied (e.g. Frederick et al., 1981).

Since Gagne's initial formulation of learning hierarchies, the Australian contribution to research on the learning of intellectual skills has been significant (White, 1981). Ethnographic studies of the learning process of tertiary level students are a much more recent development. Clear evidence of the growing interest in this field and shifts in both research methodology and theoretical assumptions about the nature of student learning emerged at the 1978 International Conference on Higher Education and led to the formation of an ongoing Working Party on Student Learning. Subsequently an entire issue of the journal Higher Education (1979) was given over to the theme 'Student Learning in its Natural Setting'.

The results so far[12] have been sufficiently promising to ensure that differences in students' learning styles, and how these interact with particular disciplines, types of assessment and approaches to teaching will be a major focus of student progress studies in the future.

Conclusion

In this review we have cited some 370 studies. What has been the contribution to policy and to action of this large amount of higher education research undertaken in Australia since World War II? The answer, if we take at face value the responses to our survey, is: not a great deal. Of the 44 studies mentioned as having had impact in terms of policy or action, only five received more than two mentions: Students in Australian Higher Education: a Study of their Social Composition since the Abolition of Fees (N=10); Promise and Performance (N=8); The Government of University Teaching (N=5); The 1961 Study (N=4); and Success and Failure at the University (N=3).

We are not inclined, however, to take these responses at face value. First, our survey sample included very few policy or decision-makers and no teachers apart from those in Departments of Education, so there is no view from the consumers of research. Second, we suspect that the views held by many of our respondents about the mechanisms connecting research and policy was a simple linear one. This may be portrayed as follows: a problem exists, a research study is designed and carried out, findings representing facts about the problem and its solution are discovered. The next phase, according to the linear view, is either direct application or, if the problem is a complex one, development. In the latter case the solutions are field-tested and worked into a form which is rugged enough for practical application. In a large system a policy decision would be taken to adopt the new approach and administrators would be informed accordingly.

There are very few instances where the application of research follows this logical progression of steps, as if education problems were amenable to a form of social engineering. Changes to education policy and practice occur as the result of numerous political, social and professional considerations and research results are more often than not only a minor consideration. Furthermore, the effect of education research is likely to be indirect and not immediate. A full account of the complex connections of research and policy would require distinctions to be made between types of research - for example, research addressing questions from theory and research addressing questions from practice. Distinctions also need to be made between various sorts of policy formation, and between policy and practice. That task is well beyond the scope of this review; however, as a result of reading the Australian research record covering the forty-year period and reflecting on the implications, we have identified seven processes in addition to the linear or social engineering process, by which research may contribute to policy and action.

1. Sensitising. In this instance a policy-maker or, more frequently, a teacher, is intimately associated with the research and as a result is influenced by having to clarify terms, or by viewing the process from a new perspective, or by reflecting on findings as they emerge. Examples are the research which was commissioned in connection with the enquiry about the desirability of secondary colleges in Canberra (Campbell, 1979); or the involvement of a university lecturer in research designed to evaluate different forms of teaching. Participation by the decision-maker or teachers has greater impact than the report written at the end of the study.

2. Social Book-keeping. The term was used by Lazarsfeld and Sieber (1964) in their review of education research to refer to the careful accumulation of records in a form amenable to analysis - census information, social service records, student performance, social background, statistics of education services, etc. - providing a data base often richer than that which can be obtained from a "one-off" social survey. The University of Melbourne and Monash University surveys of students' educational background and social origins are examples.

3. Legitimation. Often, perhaps more frequently than not, policy-makers make selective use of research results in order to support

conclusions reached on other grounds. A recent example occurred in the debate over student finance when supporters for the re-introduction of fees cited research which reported that no difference had been found in the social composition of undergraduates before and after the abolition of fees. The assertions that the abolition of fees made no difference are, in fact, false because, as Popper has reminded us, research can only disprove hypotheses, never confirm them. Those who cited the research results to support their case for fees also chose to overlook the authors' methodological discussion which pointed out that, among other things, any effect which the abolition may have had was probably masked by the disappearance at the same time of other forms of student aid, particularly State education department studentships. Nevertheless the use of research to legitimise decisions should not be rejected out of hand. At least some data has been attended to which would seem to be preferable to entirely data-free decision-making; and the citing of research provides the opportunity for the researchers to enter the debate.

4. De-mythologising. The world of education is no more free than any other of myths, fads and fancies. One particularly tenacious belief is that the performance of university and CAE students is solely a function of intelligence plus school learning. As the review of the research record for the first post-World War II decade showed, this view informed many of the studies undertaken in that period. The contribution of research has been to show that environmental circumstances (including teaching!) also have an impact, and furthermore that when all known variables are entered into the equation, the prediction of academic performance remains highly inexact. One effect of this research has been to deter universities and colleges from embarking on elaborate and costly schemes of student selection. Unlike some other countries, selection for universities and CAEs in Australia does not usually involve interviews or psychological tests. Nevertheless the myth of predictability dies hard and it appears as if each generation of higher education researchers is required to produce its own quota of studies on the prediction of academic performance. A second and even more important result of the research on prediction and selection has been to help change the question from "What is wrong with the students?" to "What is wrong with the process?". The second question has directed attention towards the quality of teaching and examining and had led, among other things, to the establishment in universities and colleges of various education services.

5. Enriching. Research provides a vocabulary of terms and concepts which enter into everyday discourse and enrich the education debate. The list is very long; some examples are: reliability and validity in examining; role, level of aspiration, reference group and motivation in social influences on learning; formative, summative, illuminative varieties of evaluation. The terms are sometimes misused or overused (motivation is an example of both) but nevertheless the conceptual clarification which researchers have provided means that discourse is more precise than when it is limited to a common language vocabulary.

6. Evaluation. This is really a version of social engineering but it has become so specialised that it deserves a category of its own. Evaluation has become popular in the last five or ten years partly because of insistent demands for accountability. Research has demonstrated that simple analogies from engineering where products are assessed against independent criteria are inadequate in the evaluation of social programmes. Criteria are rarely simple or even agreed upon by all parties and evaluation has to recognise that values influence judgements about processes and products. The complexity of social systems and the sheer impossibility of predicting all effects means that an important part of evaluation is to discover unintended consequences of actions. Furthermore recognition that there are

usually a variety of means for achieving social and educational goals has changed the question asked by evaluative education research from "Has it worked?" to "How can it be made to work better?".

7. Illuminative. The question "What is the policy impact of research?" overlooks a large amount of research in all disciplines where inquiry motivated by curiosity about the nature of things and where no practical pay-off may be intended in the short run, if at all. Historical and philosophical scholarship is obviously in this category, but much psychological and sociological research should be viewed as enriching and illuminating our understanding of education and culture rather than necessarily providing practical benefit. Such studies nevertheless may be profoundly influential - witness Plato, Dewey, Freud, Pavlov, Whitehead, Piaget - because they change the way we think about things. The impact of recent research, and here we would include the entire period of our review, remains uncertain because, as the historian said when asked about the effect of the French Revolution, "It is too early to say".

NOTES

(1) Universities Commission, 1975; Commission on Advanced Education, 1975; Schools Commission, 1975; Australian Committee on Technical and Further Education, 1974.

(2) The suspension of triennial funding in 1976 and the subsequent drop in resources prevented the University of Wollongong and James Cook University from carrying out their plans to establish units during the 1976-78 triennium; similar proposals by Deakin University were also affected. By 1979 competition for shrinking resources reached the point where there was concern over the plight of a number of the higher education research and development units in the university sector. The AARE was prompted to request written assurance about the future of these centres from the TEC (reported in the Australian Educational Researcher, 1980, 7(3), 25).

(3) For reviews of research on student evaluation of tertiary level teaching see Powell (1972), Wieneke (1976) and I. Smith (1980).

(4) For example, see Report of the AVCC's Working Party on Academic Staff Development (AVCC, 1981) and Statement on the Professional Development of Academic Staff (HERDSA, 1980).

(5) A system of independent study in carrels using taped programmes and a variety of visual material which allows the lecturer/tutor time for contact with students on their individual problems.

(6) The decline in demand for higher education is not an exclusively Australian phenomenon; for example, see L. Cerych, "Towards zero growth in higher education". Paedagogica Europea, 1977, 12, 11-20.

(7) From the year of its inception TEAS stimulated many studies of its effectiveness in promoting the participation and progress of the scheme's target group, and of the adequacy of its provision. A review of this research (see Hayden, 1981) was commissioned by the Commonwealth Department of Education as part of the Department's recent study of tertiary student finances (Department of Education, 1981).

(8) For example, see West, Hore and Boon (1980), Marsh (1981) and Prosser (1980).

(9) A study being made by the CTEC of participation in post-secondary education will be the first comprehensive analysis of the recent changes of patterns in

participation (CTEC, 1982). For a review of recent Australian research on factors affecting participation by young people in tertiary education, see Hayden (1982).

(10) The Australian National University (Mortimore and Bennett, 1978); Adelaide (Rump and Greet, 1976; Smith, 1978); Flinders (Sheldrake, 1977); Melbourne (Fitzgerald, 1979); Macquarie (Baumgart and Johnstone, 1977); Monash (McInnis and Thomas, 1976; Hore, Lawler and West, 1980; Smurthwaite et al., 1977); Murdoch (Sansom, 1979); Newcastle (Maddox, 1979); New England (Watkins, 1977b, 1982a); New South Wales (Hayes, 1974, 1977; Lewandowski, Powell and White, 1977); Sydney (Williams and Ainsworth, 1977; Williams and Pepe, 1978); Griffith (Hall and Harper, 1978); La Trobe (Gallagher, 1978).

(11) Larry Saha (1975,1979, 1980); Grant Harman (1975) and Jack Genn (1981, 1982) are among the few research workers who have attempted to fill this gap in Australian research on higher education. A new theme in this area concerns the effects of the current recession in higher education on the professional lives of academics; for example, see Hore, 1977, 1979; Powell, 1981b; Powell, Barrett and Shanker, 1981; and Lonsdale and Williamson, 1980.

(12) For example, see Biggs (1978, 1979, 1981, 1982); Brumby (1982); Thomas and Bain (1981) and Watkins (1982a, 1982b).

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Reflections of an Evaluator

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ABSTRACT

Using as a case study a major project he directed which evaluated student services in Australian higher education, the author discusses the approach and the methodology adopted. Some difficulties and inadequacies are identified and explained, and the criticisms made by some 'victims' of the evaluation are presented. Finally, the paper discusses some issues emerging from the experience of this project in such areas as the politics and climate of evaluation, consultation with and education of the evaluated, the credibility of evaluators, self-evaluation and the use of external evaluators; and points to some lessons which might be learned.

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INTRODUCTION

During the last three years the author has been involved in two major evaluative enterprises: directing a national study of student services in tertiary education and leading a series of three-day workshops on evaluative skills for senior academics. Judged by the feedback obtained from participants in the latter, they have been very successful and approval has been virtually unanimous. On the other hand, approval of the national study of student services has been somewhat less than unanimous, and the reasons for the difference have something to tell us about evaluation. Two points will suffice at this introductory stage: at the workshop, participants were not being evaluated and the situation was not threatening; at the workshop also the authority and expertise in evaluation of the two workshop leaders were accepted, whereas by some student services people the project team's competence in evaluation was not accepted, even though the director of each enterprise was the same person.

The main purpose of this paper is to discuss some of the significant issues concerning evaluation in tertiary institutions, drawing mainly upon experience with the student services project. This project which lasted more than two years was funded by the Commonwealth Tertiary Education Commission under its Evaluative Studies Program. There are obvious differences between a national study covering all sectors and an evaluation of, say, a degree course in a single institution. But many of the methodological problems encountered in the former study, and many issues concerning the acceptance of evaluations, are likely to recur in most evaluative studies, and the student services project may therefore serve as an illuminative case study.

The other project mentioned above, the workshops, also contributes something to these reflections, though much remains to be written about it. During the last two years the author and Dr. R. McDonald of Murdoch University have devised and conducted the series on behalf of the Higher Education Research and Development Society of Australasia. The workshops, like the student services project, have been funded by the C.T.E.C. Six have been conducted so far, in Sydney (May 1981), Adelaide (September 1981), Perth and Melbourne (both November 1981), Brisbane (April 1982) and Sydney again (September 1982), the last of these being residential and for senior staff in non-metropolitan universities and colleges. Normally each tertiary institution within reach of the capital city was invited, according to its size, to send two or three participants, most of whom have been at the level of dean or department head.

A general framework for a workshop on evaluative skills was provided by a set of documents dealing with what we called "Considerations in Evaluation". These documents made up the first section of an extensive file of materials developed during the months preceding the first workshop and continually revised since. Section headings in "Considerations in Evaluation" were:

Purposes and levels of evaluation ("Levels" range from single units, such as an item of teaching material or a single teaching session to departments and institutions, and include course units, whole degree or diploma courses, and individuals. A comprehensive evaluation of an institution would encompass evaluation of its departments; evaluation of a department would encompass course units, courses and the performance of individuals.)
What information will be sought?
From whom will information be sought? (This will often include self-evaluation.)
How to seek information (This covers use of both existing documentation and instruments specially devised.)
Who should carry out the evaluation study?
When to seek information
Analysis of data
Reporting of data
The climate of evaluation (Both this and the "reporting" category concern

what might be called the politics of evaluation, defined in the workshop as "The intrusion of considerations other than purely educational ones into decisions about (1) what to evaluate, (2) how to do it, (3) who is to do it, (4) what evaluative information is to be reported, (5) how, and (6) to whom".

Making use of an evaluation

Summary: Planning an evaluation

In the national study of student services, these 'considerations in evaluation' were live and often complex issues. The next three sections of this paper will use the student services project as a case study: first, a general discussion of the approach to evaluation which was adopted, then further elucidation of the methodology of the project, and thirdly, some matters on which there was disagreement between evaluators and evaluated.

APPROACHES TO EVALUATION

To evaluate, according to various dictionary definitions, is to find out, work out, or state the value of something. The entry EVALUATION (in education) in *The Fontana Dictionary of Modern Thought* reads "... the process of obtaining information, usually for administrators and teachers, about the effects and values of educational activities" (p.218). The same entry also refers to the "major conventional division of M. Scriven between formative evaluation, designed to improve a programme, and summative evaluation, designed to judge its worth".[1]

Many evaluative studies have both formative and summative elements. As might be expected, summative judgments are highly approved if they are favourable. On the whole, however, the trend is towards formative evaluation because it is explicitly more constructive. This does not mean it is always welcome. Proposals for improvement contain implicit criticisms or reflect adversely upon the programme being evaluated, and implicit criticisms can be resented even more than explicit ones. Nevertheless, it can be argued that evaluation in tertiary education should always be formative; that, unless it points the way to improvement, it is not worth doing.

The project team planning a national study of student services quickly rejected any directly summative intent. Summative judgments of so extensive and complex a set of activities could only be arbitrary. Any conclusion like "this is good ... this is bad"; "this should be expanded ... this should be discontinued" would lack supporting evidence unless there were huge expenditure of resources to gather it; and even then a large subjective element would probably remain. We decided that the prospects for even a formative evaluation were limited, and the contribution we could make would be modest and indirect.

Student services in tertiary education exist in hundreds of different and autonomous institutions in three major sectors in different states and territories, and decisions about "improving the programme" belong to the institution. A national study, while it might raise some issues, even make some generalisations, about the national scene, would in no sense be an aggregation of hundreds of evaluative studies carried out in individual institutions. It would probably be formative only in the sense of presenting a lot of information and opinions about student services, raising questions, drawing attention to issues; from all of which others might seek improvement in student services or decide to carry out their own local evaluation towards such improvement.

An evaluative study of the kind we had in mind may better be termed "illuminative". As Parlett and Hamilton described 'illuminative evaluation', it "takes account of the wider contexts in which educational programmes function. Its primary concern is with description and interpretation rather than measurement and prediction ... no method (with its own built-in limitations) is used exclusively or in isolation; different techniques are combined to throw light on a common problem ... the researcher is concerned to familiarise himself thoroughly with the day-to-day reality of the setting

or settings he is studying ... he ... takes as given the complex scene he encounters. His chief task is to unravel it ... The course of the study cannot be charted in advance. Beginning with an extensive data base, the researchers systematically reduce the breadth of their inquiry to give more concentrated attention to the emerging issues ... Illuminative evaluation ... concentrates on the information-gathering rather than the decision-making component of evaluation ...; the evaluator aims to sharpen discussion, disentangle complexities, isolate the significant from the trivial and to raise the level of sophistication of debate".[2]

Also significant in approaches to evaluation is the role of those whose activities are being evaluated. They need not be treated as specimens pinned down for scrutiny, helpless and passive victims of the ruthless evaluator. The evaluation may, in Stake's terms, be responsive. "An educational evaluation is a responsive evaluation (1) if it orients more directly to programme activities than to programme interests, (2) if it responds to audience requirements for information and (3) if the different value-perspectives present are referred to in reporting the success and failure of the programme."[3] The issues which concern those being evaluated and others with a legitimate interest in their activities help to determine the course of the study and the writing of reports upon it. The evaluator is concerned with portrayals rather than analyses.

More recently, Kemmis, after generally favourable comments on a 'democratic' model, which "moves from the realm of process of understanding social contexts to the question of the politics of information in evaluating them" and is a further development of the 'illuminative/responsive' model, has proposed "evaluation as self-reflection in a critical community". This is founded upon seven principles which "create an image of evaluation as the process of marshalling information and arguments which enables interested individuals and groups to participate in the critical debate (the process of self-reflection) about a programme."[4]

Naturally, there are many other approaches to evaluation: the Fontana dictionary entry quoted earlier commented succinctly that "the field is currently characterized by a proliferation of theory". And, although the emergence of evaluation as a major topic in education is comparatively recent, it has quite a long history. Fifty years ago, however, it was in most respects indistinguishable from research. If you wished to carry out a respectable evaluation you had to use traditional research models and experimental designs.

There is no need to present in detail here the case against exclusive use of such procedures. Experimental designs depend on the creation of artificial situations, and this can be quite inappropriate in evaluations involving the attitudes and performance of human subjects. Research models which emphasise or depend upon quantifiable data amenable to statistical treatment are of limited use in evaluative studies, because the subtleties and complexities of human behaviour are missed and are thereby devalued. Such approaches were never seriously considered for the student services project.

A major use of objective, quantitative measurements was in testing, a special category of evaluation, which is nowadays more commonly included under the heading of assessment; thus assessment refers to the performance of individuals, usually students, whereas evaluation covers courses, programmes, whole institutions; and assessment may be a contributing element to evaluation, but never the other way round. The distinction between assessment and evaluation is made in the U.K. and Australia, but not in the U.S.

Another approach, the next stage historically, was distinguished by behavioural objectives; detailed specification of, for example, how students should behave or perform after taking a course was regarded as an essential prerequisite to any evaluation of that course. Evaluation is measurement of the extent to which objectives have been achieved. Many still hold that view, although there have been and are some strong reactions against it. The reactions against evaluation being tied to behavioural objectives have been significant in stimulating the current "proliferation of theory". With respect to an evaluative study of student services, a behavioural objectives approach might have been feasible if the study were confined to a single institution, but would have been quite unmanageable in a national study involving

many different institutions.

The proliferation of theory is evidence that evaluation is a lively and in many respects a controversial field. But significant efforts are being made to achieve a stability without sacrificing the rich variety of possible approaches. A recent example is the production of *Standards for Evaluations of Educational Programs, Projects, and Materials*, developed in the U.S. by a committee chaired by Daniel L. Stufflebeam. Most of the evaluation 'names' in the U.S. had a hand in it, as writers or consultants, including Atkin, Glass, House, Popham, Tyler, Guba and Scriven. The book identifies and elucidates 30 separate standards, presented in four groups corresponding to four main concerns about an evaluation: its utility, feasibility, propriety, and accuracy.[5]

Those who, in evaluation as in research, regard the psycho-statistical or agricultural-botany paradigm as sacrosanct, reject illuminative, responsive, humanistic or descriptive evaluation as heresies. This is partly at least because there is a place for professional judgment, as well as for results. Stenhouse points out that the appeal to professional judgment involves concern about presentation and about audiences: "a need to capture in the presentation of the research the texture of reality which makes judgment possible for an audience". He suggests that illuminative approaches should be based upon the discipline of history which "founds verification on the appeal to the publicly accessible source". The historian "will prefer other people's observations to his own ... will work through interview supported by documents ... is essentially attempting to gather the perceptions and understandings of the participants in the situation he is studying and to soft-pedal his own while in the field".[6]

It was a significant feature of our workshops on evaluative skills that from the beginning we based our 'teaching' on the everyday experiences of participants in their institutions and placed much emphasis on 'informed professional judgment', rather than treading an orthodox path via the history and theories to the technicalities of evaluation.

METHODOLOGY OF THE STUDENT SERVICES PROJECT

The few items from a considerable and growing literature of evaluation briefly noted above, provide some hint of the modest theoretical underpinnings of the student services project. The approach was obviously eclectic, and also sometimes involved application of evaluative ideas to a different universe from that in which they originated. For example, much of the effort reported in the literature has gone into course or programme or curriculum evaluation. When a programme is being evaluated, it is normally only one programme under scrutiny at any one time. There are also in the literature evaluations dealing with larger entities, such as departments and institutions; but again the target is a single operation or set of operations, located in one place. A national study, covering not one student services operation but many, with thousands of participants in a variety of institutions scattered through the country, is a different universe.

Nevertheless, the kinds of considerations briefly presented in the foregoing paragraphs are applicable to this evaluative study. Here are some of the characteristics of the approach adopted, identified by phrases already used in the foregoing paragraphs:

(1) taking account of the wider contexts;
(2) concerned with description and interpretation rather than measurement and prediction;
(3) different techniques combined to illuminate;
(4) familiarisation with the day-to-day reality of a complex scene, with a view to unravelling it;
(5) course of study not (fully) charted in advance;
(6) increased concentration on emerging issues;

(7) aim to sharpen discussion, disentangle complexities, isolate the significant from the trivial;
(8) responds to audience requirements for information;
(9) refers, when reporting, to different value-perspectives present;
(10) issues which concern those being evaluated help to determine the course of the study and the writing of reports;
(11) concerned with portrayals rather than analyses;
(12) marshalling information and arguments enabling interested individuals and groups to participate in the critical debate (the process of self-reflection) about a programme;
(13) a place for professional judgments as well as for results;
(14) gather the perceptions and understandings of participants in the situation being studied.

In planning the evaluative study of student services in tertiary education throughout Australia, an early decision was to use (3) above. We needed a variety of data, from a variety of sources, by a variety of methods, if we were to gain insights into the complex scene. We would use existing documentation (published and unpublished material concerning student services), questionnaires, interviews, discussions, case studies; and we would invite letters, submissions, telephone calls from those willing and able to volunteer information.

But why did we choose these data-gathering techniques? The purposes of the evaluative study are referred to in (7), (12) and (14) above; further, in (3), to illuminate student services, (4) to unravel the complexities, (6) and (10) to identify the significant issues. The purpose was not summative. Any vague notions that may have lingered in the collective consciousness of the research team about measuring the effectiveness of student services vanished as soon as we began to come to grips with the project. The criteria for effectiveness might be (a) the academic success of students who had contact with student services, (b) the mental health of such students, (c) their success in life and/or work 5 years, 10 years, 20 years afterwards, (d) the healthy (or otherwise) climate of the institution. None of these seemed usable, because of the vast number of other variables involved and because of the vast resources required to obtain answers on a national scale; two cogent reasons. More modest criteria might be the extent of satisfaction with student services as expressed by students, by academic staff, by administrators, by student services personnel themselves. This seemed more feasible, but would carry little weight as a measure of effectiveness. Nevertheless such information would have value in providing illumination, in unravelling the complex scene, in identifying issues, in locating different value-perspectives, in retrieving the perceptions and understandings of participants. It would, of course, be impossible to get a complete picture, the views of all students, all staff, services people, and administrators; and because of the diversity of institutional contexts, any sampling would be dubious basis for generalisation.

We decided, however, to make some use of questionnaires directed to the four groups, and by asking questions about what student services were doing and how the ideal related to the reality, we expected to get at least some insight into priorities, issues and different value-perspectives. There was also a political or public relations purpose. Expectations of a national study, we thought, would include: that information be gathered from many institutions and individuals; that some quantifiable data be obtained. It would be difficult, if not impossible, to meet such expectations by interview and case study methods alone.

But we saw discussions, interviews, and case-studies as the heart of the matter. Only thus could we be immersed in the "day-to-day reality of a complex scene" and hope to unravel it. A large programme was undertaken.

Other data came to us through the volunteered comments of individuals, many of them provoked by the inevitable crudities and over-simplifications of the questionnaires. These comments, some of them lengthy, grew into a rich store of valuable information, of reactions, attitudes, analyses of issues, which it would have been difficult to obtain by other means. These contributions by letter often reinforced or supplemented material already available to the project team as existing documentation: the reports, articles and papers, historical and contemporary,

published and unpublished, on student services both in Australia and overseas. This material contained a great deal of information relevant to an evaluative study; for example, the key issues and concerns of student services people, and the contexts in which they operate.

As the project progressed, issues which concerned those being evaluated (10 above) were coming to the fore and receiving increased attention (6); and because, quite deliberately, the course of the project had not been fully charted in advance (5), we could take account of emerging issues, make changes, fill gaps. Thus, at later stages in the project, letters from the project director, posing key questions (relevant to emerging issues or the filling of gaps) went to senior administrators in the TAFE sector, to student union officials, to staff in the careers and appointments area, and finally to registrars and principals in universities and CAEs.

Last of all, we concentrated on what, from the beginning, had been regarded as a particularly crucial part of the project. It relates to (8) above, in being a response to audience requirements for information; to (10), the role of the evaluated in the writing of reports; and to (12), participation by interested individuals and groups in the 'critical debate' about student services. That debate was, of course, well under way much earlier in interviews, discussions, in critical letters provoked by questionnaires and our replies to these letters. Now, however, we provided a number of interested individuals in student services with draft sections of the final report of the project, as it was being written, and invited their reactions. This is in line with 'responsive evaluation' and with the 'propriety' standards of the U.S. Joint Committee on Standards for Educational Evaluation.

Later, when the final report as a whole had been drafted this went to about 50 student services people representing all states and sectors for comment. This, like the earlier feedback, led to modifications, repaired omissions, corrected errors or biases, added new information. We had also proposed, in sending out drafts, that, where the authors could not accept the feedback as a modification (for example, a clear difference of opinion or interpretation) or where it included new material which, though of interest and significance, was tangential to the main body of the report, we would publish such comments in an appendix to the report: and a selection of comments duly appeared. The final chapter of 'Conclusions' to the report on student services was written only after all comments had been received.[7]

METHODOLOGICAL DISAGREEMENTS

The data-gathering techniques employed in this project provoked some critical comment, which was taken seriously and responded to, often at length. Basic to many of the objections raised about methodology were misconceptions about evaluation. The critics revealed attitudes and expectations commonly associated with particular ('reputable') research techniques but often inappropriate with respect to evaluation. They persistently referred to the whole project as "a survey" of student services, and their expectations were that traditional social science research methods would be rigorously applied throughout. In all the comments and letters there was no reference to evaluative techniques; in our responses we invited further comment from anyone expert in evaluative studies, but no such contribution was received.

As indicated earlier, this evaluative study of student services was approached quite differently from a traditional research project. Research is not often a practical activity; that is, even when it addresses a 'real' problem, it rarely leads directly to specific consequences. Those engaged in it tend to feel themselves at a relatively safe distance from real life events. Evaluation, on the other hand, is specific and specific consequences are at least implied; it is concerned with real life events, there is no expectation of arriving at general laws transcending those specific events, and those engaged in it feel a responsibility for the consequences. Clearly, all those summary statements should have qualifications and

exceptions. But they suggest an underlying cause for the resistance of some student services people, familiar with research and with 'surveys', both to the notion of evaluation being something different and to the employment of different methodologies.

A second major problem underlying many of the objections was a difference of perspective. Many of our critics appeared to be demanding a methodology which might have been appropriate to a thorough study confined to their own institution. Student services personnel interested in obtaining an accurate representation of, for example, student opinion in their own institution would seek a carefully-drawn 'scientific' sample; they would want a thorough and detailed coverage of everything which might possibly be relevant to findings about their operations in that institution. But the perspective of such a group within a particular institution is very different from the perspective of evaluators conducting a national study. It might be argued that, ideally, the information obtained and the methods for obtaining it should be repeated for hundreds of institutions. Realistically, however, (to return to the 'student opinion' example) to determine and to gather information from a 'proper' sample of Australia's hundreds of thousands of tertiary students, stratified by sector, by institution type and size, by discipline, by sex, by age, by year of course, etc. etc. would require enormous expenditure of resources. The same applies to other aspects of the project; indeed, the perspective of some critics was such that anything less than a multi-million dollar scrutiny of student services seemed certain to be dismissed as inadequate and invalid.

These differences of perspective and the preoccupation with traditional research methods meant that 'questionnaires' and 'sampling' attracted the most attention. For example, we needed to taste student views and reactions to some questions concerning student services, as part of the process of illumination, as part of the identification and exploration of key issues. We had no ambitions to obtain an impeccable, nationally representative sample, and because of the wide differences between institutions we knew generalisations would be hazardous. We made crude and simple arrangements, took a rough sample of institutions, using three broad discipline groups, taking year of course into account, and had questionnaires administered at classes. What we did was economical and entirely adequate for our purpose but some found it unacceptable.

A questionnaire directed at student services personnel was criticised by some of them; the major grounds were that it grossly over-simplified issues, that it was confusing, difficult, or it took hours of agonising to come to grips with the questions. One critic commented that "it may have been possible to answer them if we took an over-simplistic view of what the questions meant"; the reply from the project director read: "There is no other realistic course in most questionnaires, particularly those dealing with complex personal opinions and judgments, than to take a simplistic view of the questions, and such a view is entirely appropriate. The questionnaire is a crude instrument which will provide us with some general ideas and pointers. The subtleties depend on interviews, discussions, and study of what people write in detail on such matters." He went on to refer to "the general area of different perceptions, communication difficulties, etc." In these terms: "You and some of your colleagues know too much! That is, you have thought deeply about, agonised over, discussed and written about the complexities of philosophy, policy and practice in student services, you can see layers of (sometimes alternative) meaning in statements, you are conscious of qualifications, subtleties, caveats, etc. etc. So you find the inevitably crude methods which must be employed in a national study alarming, even insulting. Further, you are right in the middle of it all, it is your profession which is under scrutiny, and inevitably your viewpoint is different from that of an outsider, however conscientious and well-informed the latter is."

The final objection to the project's methodology is both highly significant and difficult to rebut; it is 'lack of consultation'. This is a major issue in evaluation. There is much advice in the literature about the rights of the evaluated; to be kept fully in the picture; to have their feelings respected; and, wherever possible, it is recommended that there should be some kind of formal contract between evaluator and evaluated, specifying the dimensions of the project. By such standards, student services personnel in Australian tertiary education were not fully consulted. Such consultation would, in a national project, be an extremely difficult, time-consuming and expensive undertaking.

The issue is really in two parts; one is consultation, in the sense of prior discussion of project events, seeking advice or feedback before a particular step is taken; the other is information-giving, that is, keeping interested parties informed of progress (soon) after the event.

The scope for prior consultation may be limited by considerations of what is desirable as well as what is practicable. Negotiation and agreement as to the dimensions of the project are ideal when only two parties, the evaluators and the evaluated, are involved. When there is a third party, the sponsors of the evaluation, the matter may be more complicated. Consultation as to the methodology of the project is more problematic; consultation, yes; abdication of responsibility, no. It is to be expected that evaluators, like any other professionals, while they may seek or accept advice, retain the right to use whatever methods seem appropriate to them in the light of their professional judgment.

The practical difficulties in the way of prior consultation for the national study of student services were formidable. Ideally, when the project was approved, the evaluators and representatives of the to-be-evaluated could have planned its dimensions and indeed its methodology over a period of several months. Neither the project timetable nor its resources would have permitted this. It would have involved many and prolonged meetings in a number of centres. Prior consultation by mail is a slow process. It was attempted with some of the questionnaires; but they had to be distributed to various people, scrutinised, meetings held, detailed comments written; this process took several weeks and in 1981 created a significant delay in the data-gathering programme. This means that most of the consultation was with those student services people readily available to us, in Queensland, and these were extensively consulted. (The questionnaires were also piloted locally, for similar reasons.) Unfortunately, and apparently for ideological reasons quite beyond our control, consultation with our local colleagues was greeted by some inter-state student services people as if it were worse than no consultation at all!

Another difficulty was the flexible, responsive nature of the project. As already noted, it is characteristic of this kind of evaluative study that not everything is planned in advance; there is a continuing search for new leads, issues emerge and are pursued, gaps are noted and action taken to fill them. We were wary of making pronouncements about the progress of the project which gave any impression that things were cut-and-dried; yet an account emphasising the flexibility would be likely to cause further distress to those who had little confidence that we knew where we were going!

SOME POINTS FOR EVALUATORS

This final section of the paper is devoted to some areas of concern for evaluators: lessons one might learn from the student services project, problems which need to be approached with particular caution, matters on which decision may be difficult. It does not pretend to do more than sample the issues which may face an evaluator.

Questions of Climate and Politics

It might be argued that, in a general sense, the current climate is favourable to evaluative studies. But although 'accountability' has become a very familiar term, and although tertiary institutions at least pay lip-service to the desirability of regular and systematic self-scrutiny, there is a considerable distance between institutional acceptance in principle and the individual staff member's practical cooperation in a real evaluation.

Evaluators need to work at creating a favourable climate. Since the very word 'evaluation' can evoke defensive feelings, it is a formidable task. In the student services project it was even more formidable because of the presence of a third party, the Commonwealth Tertiary Education Commission. 'Presence' is too strong a

word; the C.T.E.C. funded the project as part of its Evaluative Studies Program, but did not interfere with it in any way. Student services people (and, indeed, the senior administrators in one or two institutions) were nevertheless inclined to see the C.T.E.C. as a presence, shadowy, sinister, poised to strike. Considerable effort, which continued throughout the project, once it was under way, went into trying to allay suspicions, voiced in such questions as "What's the C.T.E.C. up to?" "How do we know what use they'll make of the information they get?" Also heard occasionally were more direct allegations that it was all part of a fiendish plot by the C.T.E.C. to reduce drastically or to eliminate student services. People wrote to us and quoted "rumours circulating" to that effect.

These were the reactions of a small minority. Others, if they felt threatened, gave no outward indication. Many others were cheerfully cooperative. Nevertheless vocal opposition from even a few can have a disproportionate effect on the climate. Thus the task of creating a favourable climate had to start from considerably behind scratch in some institutions.

In many evaluative studies the 'victims', as some undoubtedly see themselves, tend to see the process as summative; that is, as leading to judgments which might affect them adversely; and thus they feel threatened. At the same time, they are not receptive to assurances that the major thrust of an evaluative study is formative. Sometimes a formative purpose, that anyone should aim however indirectly to bring about improvements in what they do, is regarded as somewhat insulting, a reflection on their professionalism, a move against their autonomy.

Thus, to have any hope of creating a favourable climate, an evaluative study must deny any summative and may even have to soft-pedal its formative purposes. This means that it is scarcely an evaluative study at all, in any of the normal meanings of evaluation. It is a study which explores the situation, describes it, identifies and discusses issues, but which does not pass judgments and which implies rather than states possibilities for change or improvement. It can be argued that in 'evaluating' the operations of responsible, professional people, this is the right and proper way to proceed, and that they can be left free to draw their own conclusions.

Unfortunately, however, the situation is Catch 22. Resistance to evaluation, suspicion, occasionally paranoia, may theoretically be overcome by 'evaluators' adopting the kind of stance described in the last paragraph. But this approach then provokes complaints that the evaluation is not thorough enough, that the evaluated want firm proposals and recommendations; they want a lead, a path to follow; "You're not telling us anything we don't know so what's the point?"

It can be argued that soft-pedalling, even in an explicitly formative evaluation, has at best a short-term justification. Evaluation is a fact of life. We all make evaluations, of activities, processes, ideas, people, print and non-print materials, all the time. Mostly we do this unsystematically. If, therefore, we find that any attempt to do it systematically frightens us, we should learn to overcome our fears and resistance. If evaluators try to pretend they are not really evaluating, they are doing a disservice to individuals, to institutions, to the whole climate of tertiary education; because they themselves are nervous, they are not giving others the chance to become more courageous about evaluation, they are assisting in the continuation of an unfavourable climate. Therefore, even at the risk of giving offence, they should be courteously tough-minded, considerate of the feelings of the evaluated but relatively uncompromising.

It can be seen therefore that the politics of evaluation are extremely complex, and the task of creating and satisfactorily meeting reasonable expectations in the to-be-evaluated is formidable. A national study such as the student services project, where wide differences of view about what will be done and about what ought to be done are bound to exist, presented particular problems.

The Evaluated — Consultation and Education

Practical difficulties notwithstanding, we should have attempted more prior consultation on a wider scale. With hindsight, it seems we did not give it a sufficiently high priority among the insistent demands of a complex national project

and a busy timetable. We were always anxious to get on with it, concentrating on minimising delays rather than creating more. And we always had, as an important objective, the significant exercise in prior consultation to come later: the circulation for comment of the draft report before it was finalised.

But in the information-giving aspect of consultation too, our record should have been better than it was, even though a great deal of time and effort went into it. Some of the same difficulties (or excuses) applied; the geographical dimensions of the project, the busy timetable, for example. But again, we failed to give it a high enough priority. Essentially, we gave information as fully and freely as possible when we were asked for it, but, after the initial efforts, we only occasionally got around to volunteering it. Whenever we had contact with anyone concerning the project, we tried to give some kind of picture of its progress. The project director replied to all comments and criticisms, often at considerable length, and this also involved a great deal of information-giving.

In particular, we had difficulty in establishing productive relationships with officials of the professional organisation of people employed in the student services area, the Australian and New Zealand Student Services Association (ANZSSA). It is obviously important in any evaluative study involving professional staff that particular efforts be made to obtain the support, even the sponsorship, of the relevant professional association. Although our failures with ANZSSA had unexpected compensations in that the disagreements engendered lively discussions and significant insights, the benefits of effective cooperation would have been greater.

The experience of this project suggests two major considerations for evaluators if they are to give a high priority to establishing and maintaining close and productive contact with their 'victims'. Both are complex.

(1) How much 'education' of the evaluated is needed before they can be in a position either to veto consultation processes or to decide to provide useful input, having sound bases for either decision?

(2) In consultation, how much 'control' belongs to the evaluated? Should they have a major role in deciding what is to be done? How it is to be done? Should they have power of veto?

The experience of this project suggests that a great deal of education is needed. Otherwise evaluative study proposals are likely to be judged by criteria imported from research and probably from a particular type of research methodology. This means that a crucial part of the information-giving is information about evaluation and its techniques. In fact, a general educational programme for staff of tertiary institutions concerning evaluative studies would be an important contribution towards creating a favourable climate and converting the stance towards accountability from one of lip-service to one of action.

The series of workshops on evaluative skills referred to earlier in this paper is highly relevant in this context. The C.T.E.C. is obviously conscious of the need for such education. In its original statement introducing the Evaluative Studies Program, the Commission referred to "promoting a climate of critical self-assessment within institutions, and encouraging the development of evaluative skills."[8] Its support for workshops directed at senior academic staff is precisely in line with that objective. Eventually, perhaps, the answers to the second set of questions above might mean that all evaluations would become self-evaluations, with varying amounts of input as needed in the individual case from 'expert' evaluators.

Credibility of Evaluators

Another area which seems to have required a higher priority than it received in the student services project is the credibility of the evaluators. This is connected with the foregoing discussion about the need for extensive consultation of the evaluated. Continual requests for information and demands for various types of consultation (often arising from objections to adopted or proposed procedures) can be a consequence of lack of trust. The points made above concerning the education of the evaluated may well provide a remedy here also. One way for evaluators to

establish their credentials is to 'teach' others something about evaluation, and thereby to earn some kind of authority in the matter. This may be an unattainable goal. In this project, most of those evaluated did presumably trust the evaluators and readily cooperated in the project. It may be that the minority who remained for one reason or another sceptical would not change their views whatever additional efforts were made; perhaps feeling that nobody but themselves could attain adequate insight into and therefore be competent to evaluate their activities.

Those proposing or planning an evaluation need to devote careful attention to the choice of evaluators. The factors which make them acceptable to the 'victims' may be subtle and complex: academic status, regardless of known expertise in evaluation may be significant in one situation, known expertise in evaluation regardless of status in another; a reputation for thoroughness or fair-mindedness or decisiveness, any or all, may help; to be a colleague of the evaluated or from the discipline which is the object of enquiry may be an advantage or a disadvantage; and evaluators may have admirable credentials in status, expertise and much else but be unacceptable because they are not amiable or tactful enough or demonstrate other deficiencies in interpersonal relationships.

External Evaluator or Self-Evaluation?

The credibility or acceptability problem would disappear if all evaluations became self-evaluations. But it is arguable whether this would be desirable even if, with widespread development of evaluative skills and a climate generally favourable to evaluation, it became a possibility. The C.T.E.C. while promoting "critical self-assessment" in institutions, in the passage already quoted, also strongly favours the use of external evaluators:

> "The Commission wishes to encourage institutions and authorities to look critically at their activities, and to do so by making use of evaluators external to the institution itself. The Commission believes that it would be in the long-term interests of institutions to make more use of external evaluators, and that it is particularly fruitful for institutions and authorities to examine the quality of the work of faculties, schools and departments."[9]

Like all the section headings of the file of materials developed for the evaluative skills workshops and listed earlier in this paper, "Who should carry out the evaluation study?" can lead to some complexities. A department or those in charge of a degree course may be able to decide "Shall we get someone to evaluate us or shall we do it ourselves?" But if the decision to evaluate has been taken by somebody else, it is unlikely that they will be invited to do it themselves. Then the evaluators may be from within the institution or from outside it; they may be given a free hand or a very broad general brief; at the other extreme, they may be given a long list of highly specific questions to which answers are sought. Those sponsoring or designing an evaluation may choose an evaluator or evaluation team from among themselves. The arguments for using outside evaluators may be phrased in many different ways, but they usually relate to justice being done and being seen to be done, objective scrutiny with no axe to grind. The arguments against are also familiar: for example, "they" won't understand our special problems, it will violate academic freedom (in addition to arguments less likely to be enunciated, querying the competence of the evaluators or the desirability of 'rocking the boat').

The converse of some of these objections constitutes the arguments for self-evaluation. If we belong to academia, if we have the clear, rational, objective capacity of the true professional, we can surely turn the spotlight on ourselves and make as good an appraisal as any outsider could; better, because we understand what we are doing and why, and the constraints upon us, far better than anyone else could. The process is relatively non-threatening, since we can abandon it or withdraw from it at any time, and since we can keep these delicate matters private. There are, of course, reputable and less reputable reasons for preferring self-evaluation.

An important distinction needs to be drawn, obvious as it is, between self-evaluation by a single self, and self-evaluation by a service or unit or department to which several people belong. To some extent a department's self-evaluation is an

aggregate of the self-evaluations of the individuals who belong to that department. But it is much more than that. Relationships among those individuals will be crucial. Will they be concerned to secure favourable evaluations of themselves at the expense of others? Will they keep themselves and each other honest? Will they be united and supportive of each other?

It is often suggested that self-evaluation should precede evaluation by others; that is, self-evaluation is a desirable preliminary step before external evaluators move in. (They may be 'external' to the unit or department, 'internal' to the institution, or external to both; and an evaluation team may contain both categories.) Holdaway in a recent discussion of the review process in universities describes in detail the system evolved at the University of Alberta; it features seven-year cycles of reviews of all departments; and an important principle is that, over a period of about three months, each unit should prepare a self-study report as a starting point for its review.[10]

Again, the situation in a national study is very different. It is conceivable that the various student services in scores of institutions might have been invited to conduct self-evaluations before the major project got under way. One possible focus of this might have been to identify problems or areas to which the project should give particular attention. The practical difficulties of conducting a national project using the widely different foci proposed by individual services and institutions would certainly have been formidable. Nevertheless, had a number of self-evaluations been available these would have provided an informal input of some value to the project.

It seems more important, however, that a national study should be <u>followed</u> by self-evaluations by individual services and institutions. It should provide, at the very least, some impetus for critical self-examination. If the result of such self-examination is rejection of the comments and conclusions of the national study as untrue or inapplicable to <u>this</u> institution, this may still be a significant and useful outcome. It is sometimes claimed that consciousness-raising is one, if not <u>the</u>, major benefit from conducting an evaluative study; sometimes, it seems, the evaluated profess indifference or hostility to an evaluation while it is going on but by the time the report is written they have already quietly implemented its findings!

As already observed, evaluation, including self-evaluation, is a fact of life. We do it all the time. But mostly we do it informally, unsystematically; which often means with bias, unreliably, invalidly. If self-evaluation is to be accepted and respected, it has to be systematic self-evaluation. It has to adhere to certain principles and procedures, and to do so publicly. Thus, there are distinctions to be drawn between self-evaluation and self-questioning. There is, as already noted, a considerable gulf between paying lip-service to accountability and actually doing something about it. There is a morbid, pointless kind of self-questioning, a rhetorical breast-beating, which seems to be designed to forestall any demand or resist any pressures for action. "Look at me, how honestly self-critical I am; and if I say that often enough it will absolve me from making any changes." Self-questioning may be a preliminary and indeed a stimulus to self-evaluation; or it may be a substitute for it. Self-questioning, unless it leads to self-evaluation in an active sense, is merely self-indulgence.

Serendipity!

A final lesson from the student services project is that evaluators should be always alert to information which may come to them unexpectedly. There is a delicious irony in the fact that those who were critical of the questionnaires and the methodology related to them were provoked to provide in many cases more valuable information than the questionnaires themselves could have produced. It is tempting to recommend to evaluators a policy of deliberate provocation! We were not deliberately provocative in this project, either in the questionnaires or in the draft report sections we distributed for comment; but both provided richer information than we could have hoped for. Nevertheless, although planning for serendipity is a contradiction in terms, there can be dividends for evaluators in presenting controversial issues or crude simplicities and awaiting the reactions.

NOTES

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The Relevance of Tertiary Science Courses to Professional Employment: Who Decides and How

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ABSTRACT

As undergraduate courses in science are widely regarded as vocational training, they are evaluated by various groups as preparation for, inter alia, professional employment. However, the criteria for evaluation are usually not agreed because the groups describe the work of scientists in substantially different terms. In this paper, the perceptions held by several specific groups are outlined. The academics' perception is of up-to-date, sophisticated scientific principles; the perceptions of other experienced scientists are in terms of the use of knowledge and skills to solve problems, and the attitudes consistent with being an employed professional. Undergraduate curricula are largely determined by the academics' perception because no effective means has been found for academics to understand and accept the other perceptions. Acceptance of the other perceptions may lead to substantial changes in curricula.

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INTRODUCTION

A tertiary course in science is often claimed, by educational and professional institutions, to be relevant to and a prerequisite for employment as a professional scientist. Determination of the relevance of a tertiary science course to the subsequent employment of the graduates requires criteria of relevance based on information about the nature of the professional work of science graduates. The information used by various people to establish criteria of relevance is not in the form familiar to scientists, viz. quantitative facts, verified by measurements and established in a theoretical framework on which there is substantial agreement. Rather, the information is in the form of opinions; there is often a bias in the collection of the opinions and an absence of a theoretical framework for the interpretation of the results; even when a theory is used, its application is qualified by uncertainty. People responsible for making a decision when faced with information of doubtful reliability and validity tend to ignore the information and rely on their personal judgement. Decisions about undergraduate science curricula seem to conform to that pattern.

This paper examines the characteristics of opinions expressed by various groups about the nature of professional work, discusses why most of the opinions are neglected in the design of curricula, presents some relevant results and conclusions from a survey of scientists and engineers employed in Australian industry, and offers a suggestion for how to improve the relevance of a curriculum. The discussion centres on chemists, because that is the group of scientists most familiar to the author, but published statements referring to other scientists, and even to engineers (Prosser, 1982), indicate that the observations apply to most of the pure and applied physical scientists. Also, chemists seem to have been selected on more than one occasion for particular scrutiny by investigators reporting to government or institution.

VALID SOURCES OF OPINION

Academic Scientists

Within a particular educational institution, it is the responsibility of the academic members of the chemistry department to design the curriculum of the chemistry course(s). Their recommendations are examined by academic colleagues from other disciplines in faculty meetings, etc., and, perhaps, by a board of studies outside the institution with power to accept, modify or reject the design. Sometimes the department has an advisory committee which may suggest changes, as well. The substance of the proposed course is likely to be altered by the reviewing groups only if it has obvious weaknesses in terms of resources available or student numbers, or if it includes radical departures from the accepted pattern and methods of presentation. As will be shown in the following sections, no other group has any significant effect. Thus, it is the perception of professional practice held by the majority of academic scientists (plus their desire to educate as well as vocationally train) that determines the curriculum.

To most academics the practice of, say, chemistry means the use of up-to-date, powerful concepts, theories and techniques to obtain and interpret chemical data for the resolution of chemical problems. Not often do academics acknowledge that management of the physical, financial and personnel resources for chemical research requires the systematic use of concepts and techniques that fall outside chemistry. Similarly, the psychological and sociological aspects of teaching, learning and research are rarely mentioned in a description of a chemistry department's activities. Much seems to be made of chemical knowledge and relatively little of scientific skills and values in the formal statements of academics, although it is clear that these last two have a major effect on their own success as chemists. The academics seem to concentrate on what chemistry is rather than on what chemists do.

Advisory Committees and Employer Representatives

Sometimes a state government or a professional institution appoints a committee to advise, recommend or decide on the acceptability of a course. Such committees contain one or more representatives of the potential employers of graduates of the course. Typically, those people are 'managers' of research or technical service departments; they have responsibility for the hiring and deployment of professional employees. Their perception of professional work is related to those roles and is manifested by statements describing an ideal for the employed professional.

Buley (1972) has given an excellent account of a personnel manager's perception of what an industrial organisation expects from graduates in science and engineering. He describes several functions in industry and, in some detail, the attributes of graduates which are particularly relevant to each function. The following statement of Buley summarises the overall ideal sought by him and other managers.

> "A graduate is someone who, by undertaking an intellectually demanding study of one or more bodies of organised knowledge, principles, hypotheses and ideas, has acquired certain fundamental intellectual qualities, including the ability to learn and to apply learning in new and unfamiliar situations. (Buley's emphasis). During this process, the graduate will also, we hope, have acquired knowledge and skills which are immediately useful, but this is neither a necessary nor a sufficient condition. The definition, it should be noted, is not in terms of the duration of the course, nor of its content, since these will vary for different individuals, but in terms of his aptitudes, attitudes, and behaviour at the end of it. (pp 55-6)"

Members of advisory committees having such an ideal have opportunities, through formal and informal meetings with academics, to influence curricula. However, for three reasons, they are unlikely to effect any major change in curricula. First, they are usually asked to respond to a detailed proposal rather than initiate the design of a curriculum or choose between widely different curricular options. Second, although they may be inclined to evaluate a course in terms of the expected 'aptitudes, attitudes and behaviour' of the graduates, the discussion will centre on the duration and content of various parts of the course. They will be prepared to accept any curriculum that appears to provide 'an intellectually demanding study of one or more bodies of organised knowledge, principles, hypotheses and ideas'. Third, most people who have reached a managerial position in industry have learnt that there is little to be gained by pressing their opinions about proposals for which they have no direct responsibility.

Some college and university departments have sought, via surveys, the opinions of employer organisations (e.g. Anderson, 1978; Anon., 1979a and 1979b). Although the results indicate that the employers would like more consideration to be given to their aims for professional training they also indicate general satisfaction with the quality of graduates. Not surprisingly, the latter outcome has more influence on the curriculum designers than the former.

Groups Outside the Profession

People in positions that enable them to influence public opinion occasionally make statements about the contributions that scientists and engineers (technologists) can or ought to make to the community. Politicians, captains of industry and the directors of public utilities come within this category. Their statements usually refer to the broad opportunities and restraints of technology, and they are trying to influence the number of people seeking careers in technology and the attitudes of technologists on broad political or economic issues. These opinions may have an indirect effect on the morale and motivation of both teachers and students. They probably have no direct effect on specific aspects of the curriculum.

The people who make these statements rarely meet with the academics who make the decisions about a particular curriculum, which is probably why they have little influence most of the time. However, on the rare occasion that a direct intervention is made affecting the supply of money or students, the effect is substantial.

Vice-Chancellors and other leading academics outside the science disciplines do not attempt to influence a particular curriculum, but they do publicise the virtues of research, scholarship, elitism, academic freedom, etc. These statements have the effect of reinforcing the inclinations of the science academics to neglect the perceptions of people not regarded as scholars or top-line researchers.

Recently, sociologists studying the nature and performance of professional groups have described scientists in terms that are far removed from the idealistic statements scientists used to describe themselves 30 to 40 years ago. For example, Johnson (1972) describes, in forceful terms, the professional employed in industry as working within a system of patronage where his attitudes and professional behaviour are dominated by the patron's (employer's) expectations and not those of the scientific community. This view of scientists and engineers is widely held by social scientists and others at present. More recently, established scientists are also describing the scientific community as far from objective and disinterested, e.g. the paper titled "Honesty in Science" (Manwell and Baker, 1981).

The sociologists have had no noticeable impact on curricula because there has been only sporadic dialogue between them and the academic scientists. Perhaps now the latter are publicly acknowledging that scientists are inclined to be subjective and 'interested', like most other people, there will be some curriculum changes in reaction.

Most recently, two manpower economists, Bosworth (1981) and Hunter (1981), have concluded that, when recruiting many of their professional staff, employers use tertiary courses in science and engineering as screens to select the proven learners whom they intend to educate further. They suggest that employers are more concerned with the class of degree attained by the graduate and the reputation of the awarding institution (partly based on their own experience with people connected with the institution) than with the content of the course. This conclusion of the manpower economists is consistent with the quotation from Buley above, and is probably based on many similar statements by employer representatives. The manpower economists' perception, with its support from the employers, ought to have an effect on science and engineering curricula. Again, the lack of any persistent contact between the manpower economists and the majority of academic scientists seems to be the reason why the former's perception has been neglected in the design of most curricula.

Recent Graduates

The young graduate's perception of professional work is arguably the most important of all in determining relevance. Even if one claims that training should aim at some ideal form of practice, the reality should be used to help identify the specific items of the ideal. For example, the academics and the managers present substantially different, but still idealistic perceptions of professional chemistry. The opinions of young graduates should help to determine whether or not an ideal based on chemical principles and techniques is more relevant than one based on a range of problem-solving and decision-making skills and attitudes.

Statements from the academics, managers and other groups mentioned above are frequent and often spontaneous. By comparison, statements from young graduates are rare and require a prompt. (A few recent graduates retain an informal link with their lecturers. They do so partly because they share the attitudes of those lecturers. For that reason, they are unlikely to be typical of all graduates.) The only way that the spectrum of opinions of a representative group of past graduates can be obtained is by a survey. This has been done on several occasions; the conclusions seem to depend to a considerable degree on the questions asked and the context. An outline of the questions and conclusions from four different surveys will illustrate the importance of the survey questions.

Kabos, Mackie and Napper (1973) set out to obtain information about aspects of chemistry relevant to employment that would assist in the design of chemistry courses and help students to select from the options available. Their questionnaire asked members of the R.A.C.I. which topics in chemistry they found relevant to their work and in which broad area of chemistry they worked. Only two topics outside chemistry were included, viz. 'management science' and 'information processing'. 8 topics of the 29 nominated were rated as not relevant by a majority; only 'quantum chemistry' was rated of low relevance by all sub-groups of the respondents. Of the relevant topics, 'chemistry of the environment and resources', 'management science' and 'information processing' were said to have been inadequately dealt with in their undergraduate course by 90% of respondents, next in these terms were 'biological chemistry' and 'polymer chemistry' (70% of respondents). After reading the results and explanatory remarks one could reasonably conclude that the majority of respondents were satisfied with most aspects of their undergraduate experience. The changes suggested were in the nature of fringe additions to the core of chemistry rather than subtractions. (Similar surveys by academics from other disciplines have yielded virtually the same results and conclusions.)

Dunn, Kennedy and Boud (1980) sought information from established scientists and recent graduates on their perception of the development of scientific skills at the undergraduate level. The skills, as stated, were not related to any scientific discipline nor body of knowledge. The results were presented as scales of 'increasing need for action' in undergraduate curricula. For the established scientists, this scale was derived from questions asking how important each skill is for professional work, how well new graduates possessed the skill and whether the skill should be developed before graduation or subsequently. For the recent graduates, the scale was derived from questions asking whether the skills had been required so far and whether the opportunity for development had been adequate during the undergraduate years. The established scientists rated various communication skills highest on the need-for-action scale with 'drawing conclusions from results', 'use of safe working procedures' and planning, selecting and executing procedures within an investigation close behind. On the other hand, the recent graduates rated 'directing/managing people', verbal communication and experimental design skills highest. Overall, it was concluded that there was a requirement for the conscious development of the broad range of communication and investigational skills in science curricula.

In another survey of scientists, Jones (1969) sought information on techniques and subjects of use to industrial scientists, important and desirable attitudes for an industrial scientist and observations about course design. The responses showed that a variety of topics outside physical science were considered useful but were not adequately dealt with in undergraduate courses. Similarly, the courses were said to be unsatisfactory in terms of expected attitudes. Overall, Jones concluded that "there is clear evidence that a large body of professional scientists feel that the graduates of (traditional undergraduate) courses are inadequately prepared for a career in industry".

Paul (1970) carried out a comprehensive survey for the Committee of Enquiry into the Relationship between University Courses in Chemistry and the Needs of Industry (the Eaborn Committee) sponsored by the Royal Society and the Royal Institute of Chemistry. Her results and conclusions were incorporated into 'The Eaborn Report'. The survey consisted of group discussions, depth interviews, semi-structured interviews and postal questionnaires for each of recent chemistry graduates in industry, supervisors of those graduates, persons in industry responsible for company policy towards chemistry graduates, persons in industry responsible for selecting chemistry graduates, final-year chemistry undergraduates, pre-doctoral chemistry research students and university teachers of chemistry. The 200-page report covered, inter alia, the industrialists' view of the merits of various first-degree courses, the qualifications and qualities industry looks for in chemistry graduates, the broadening of university courses, sources of information about careers, contact between universities and industry, career values of chemistry graduates, job dissatisfactions of chemists working in industry, and factors which influence graduates against taking up employment in industry.

Among the conclusions in Paul's report were the following statements:

> "it seems likely that the confusion as to the aims and requirements of university and industry with regard to chemistry courses ... is ... a sign of woolly thinking among chemists about these problems (p 254)"
>
> "it is clear that there is a feeling ... both in universities and industry that the general education of most chemistry students is inadequate (p 254)"
>
> "vocational guidance ... is clearly both lacking and needed ... as the findings on the amount of misinformation students had picked up about industrial conditions show, there is a great deal of work to be done (p 256)"

and from the Eaborn Committee

> "our surveys show that a clear majority of the undergraduates, postgraduates, and recent graduates now in industry, consider that their first-degree chemistry courses involved 'too much learning of facts' ... (p 5)"

The tenor of Paul's report was that the present relationship between universities and industry was most unsatisfactory for the young chemists and there was a clear need for both the universities and industry to thoroughly examine their aims and methods of dealing with these people.

The writer carried out a survey which indirectly approached the question of relevance. Most of the significant questions were framed so that respondents could describe their activities, skills and attitudes in terms consistent with their current work. The description of professional work that emerged was compared with, inter alia, undergraduate curricula. Direct questions about the relevance of the undergraduate experience to work were avoided. However, in reply to the open-ended questions and at the end of the interview many respondents spontaneously made comments that supported the conclusions drawn from the forced-response questions.

In brief, physical scientists and engineers employed by several companies in the mining and manufacturing industries (excluding the chemical industry) were sent a questionnaire covering qualifications, various biographical details, their experience in the different functions of industry, their work activities, the skills they used (scientific and other), and various aspects of their attitudes to their work and colleagues. 645 replies (~30% of those contacted) were received. Later, 104 of those respondents were interviewed about the development of their skills and their attitudes towards their colleagues. The respondents were employed in a wide range of industrial functions; most were under 35 years of age.

Respondents rated activities to do with plans, proposals, or theories as the most important; 'people' activities next and activities to do with machinery, apparatus and materials as the least important out of five groups. Confidence in non-mathematical skills of analysis and synthesis was highest, followed by problem-solving skills and people-management skills. Confidence in the skills for working with apparatus, etc. was low, and mathematical plus computing skills were the lowest of all by a substantial margin. During the interviews, 83% of respondents said they acquired their best skills through experience, 55% had also learnt them via formal education, but mainly in second degree courses or short management courses. 59% said their weakest skills (usually mathematical) were the result of lack of use. One conclusion is that there is a clear disparity between the activities and skills these people learnt as undergraduates and those they use as employees. The spontaneous comments tended to confirm this conclusion. (More extensive results have been reported elsewhere - Prosser, 1980.) One overall impression gained from the responses was that many of the conclusions of Paul, outlined above, were applicable to Australian graduates.

Differences Between Groups of Graduates

The replies from the 645 scientists and engineers mentioned above were analysed to identify significant differences between groups. The groups were selected by initial discipline, age, present function, principal activities and overall confidence in skills. More numerous, and sometimes greater, differences were noted when the replies of the respondents were grouped by industrial function and age than when grouped on any other basis, such as initial discipline. The larger functional groups were 'production', 'technical services', 'design' and 'senior management'; 'research' was a smaller group.

The most distinctive group was 'senior management', which was more involved than any other group with resolving problems arising from controlling the work of other people; the managers did not regard technical aspects of their work as important. They had a high level of confidence in the skills they required for their work but admitted they were no better than average at the more technically-oriented skills. Although they were no different to other groups in their general level of job-satisfaction, the causes were different - more often they mentioned interactions with people, corporate objectives and decision-making as sources of satisfaction or frustration.

'Production' staff were the most involved with machinery,apparatus, etc.; they were confident in the skills required for that work, but exceptionally low in their confidence in the mathematical skills. Overall, their replies conveyed the impression that they were in the process of abandoning their previous identity with technical groups and adopting the managers as a reference group. The 'technical service' staff - the most heterogeneous group - had the lowest involvement with people. (There was a suggestion from the interviews that some of them are in technical services as a refuge from extensive involvement with people.) They had the lowest level of confidence in their skills overall, and were uncertain in their attitudes to colleagues. The 'research' and 'design' groups were similar in that they were technically orientated and had little empathy with management.

Some of the differences between the scientists and the engineers, and between the six age groups, arose from a correlation between those characteristics and industrial function. (As examples, few people under 30 years of age were in 'senior management'; engineers were more likely to be employed in production and design, whereas scientists were more likely to be in research and technical services.) These and other differences are to be presented in more detail elsewhere.

The more significant differences that were found among the functional groups than the disciplinary groups suggests that scientists and engineers in industry undergo processes of socialisation. They gradually change their values and attitudes as their work environment changes. They leave tertiary education regarding themselves as chemists or electrical engineers or metallurgists, but within a few years their reference groups change to 'technical expert' or 'manager'. By the age of 30 years, it seems that a chemist in technical services will have more in common with a design engineer than with another chemist who is a production supervisor. One may presume that a graduate's response to questions about professional training is influenced by the substantial change in values that may occur during employment.

Impact of Graduate Surveys

One important characteristic of surveys, not noted before in the context of who decides about vocational relevance and how, is that the person who has conducted the survey is usually much influenced by the responses, particularly if interviews are included. Others, who see only condensed summaries of the results and do not have the opportunity to discuss them in detail with the investigator may be hardly affected at

all. Informal reaction from these people is sometimes to distort or discredit the findings by statements of the type 'did not mean that really' and 'must have come from a cynical group'. The committees that commissioned some of the surveys are inclined to react between these extremes. They accept some of the findings and recommend changes accordingly. However, they sometimes reject other findings with statements like 'we are not convinced by the evidence'.

Science Teachers in High Schools

The discussion elsewhere in this paper is concerned with scientists employed in industry or in government agencies such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Although the professional employment of scientists as high school teachers is substantially different, the same sort of analysis can be pursued. Briefly, the perceptions of high school teaching held by principals and inspectors (the equivalent of the managers), and young teachers, are no less valid than those of academic scientists and educators in determining what is vocationally relevant.

High School and Undergraduate Students

The perceptions of students contemplating entering a science course or already in one have a special validity. First, those perceptions are, presumably the basis for the decision to embark on a career in that science. Second, changes in perception as the student progresses are one indication of the effect of the total undergraduate experience - intentional or not. As indicated above, Paul (1970) concluded that some misconceptions about work in industry appeared in the minds of undergraduate students which were removed only when they entered industry.

CRITERIA

The majority of students studying science expect to be employed as scientists; their teachers share this expectation, and so does the community at large. Notwithstanding other broad aims that may be adopted for science courses, there is usually one aim which is consistent with that expectation. The achievement of that particular aim is the justification for seeking criteria by which relevance to employment can be determined. Other aims may exist, leading to different and, perhaps, conflicting criteria. Only those criteria related to employment are developed here.

The nature of the information from various sources about the relevance of science curricula to employment has been described above. In principle, this information should enable one to establish criteria with which to evaluate the relevance of courses and specific topics. The main obstacle to establishing such criteria is the lack of agreement on which description of professional work should be used as the basis. Options for this basis include:-

1. A statement of the principles and techniques required by a scientist in one or more idealistic, but unspecified forms of professional work. Sometimes the principles and techniques specified are limited to those belonging to the scientific discipline (the basis preferred by most academics); other times they include principles from management, economics and communication as well as science (the basis suggested by some surveys of graduates).

2. A statement of the skills and attitudes, with knowledge as a subsidiary require-

ment, that the ideal employed chemist is expected to use in solving problems and working with people (the basis preferred by the managers).

3. A statement of the knowledge, skills and attitudes actually developed and used by the employed chemist (the basis derived from other surveys of graduates).

Note that these bases differ in more than one dimension, i.e. in terms of the diversity of the principles, the importance attached to skills and attitudes compared with knowledge, and the preference for ideality or reality.

One aspect of the problem of reaching agreement is illustrated by what some academics imply are the requirements of people in industry. It is implied that industrialists want descriptions of production processes included in chemistry courses. As examples, the Eaborn Committee (1970) wrote:-

> "Suggestions are made from time to time that all chemistry degree courses should include instruction in industrial chemistry. We do not consider it either essential or desirable that this subject should be forced upon every student ... At the same time, reference to modern industrial processes should be used in the ordinary courses to illustrate theories and generalizations of chemistry, because a student cannot be considered educated as a chemist if he is not made aware of the range of practical facts and concepts. We also suspect that appropriate choice of examples of commercial applications will increase the interest of the course for many students, and that more good students will be stimulated to give thought to the challenge offered by industrial problems. In this connection a responsibility falls on industry to provide up-to-date information on new processes. (p 15)"

Holliday (1972) wrote:-

> "Thirty or more years ago most honours degree courses in chemistry ... did have an applied content. I myself learned quite a lot about certain industrial processes; mostly about the relevant chemistry, but also about the economics of the processes ... All these processes are long since dead and gone ... Not surprisingly therefore, courses of this kind have long since been squeezed out of special honours degree syllabuses ... Courses which show more promise are those such as the one in industrial studies at Liverpool ... The difficulty here is one of level. The honours student whose mind has been stretched by the rigours of statistical thermodynamics of modern stereochemistry finds it hard to adapt to an industrial case-study or to elementary economics. (p 75)"

and Jevons (1969) wrote:-

> "The fit between education and career is rarely close and often barely detectable. This is a matter ... of largely unalterable principle ... education cannot achieve anything more than a very imperfect match with ... what employers think they demand. Job contents are too many, too varied and too unpredictable, and to a greater extent they are unteachable anyway. ... the educational system could not, in any case, tailor-make courses for all functions in industries.
>
> Take as an example to illustrate the issues involved, a hypothetical but not unrealistic proposal to institute a course of studies at a university in 'X science' or 'X technology', where X is some product for which there is substantial demand. ... The argument against the proposal is <u>not</u> that the subject-matter would be intellectually unworthy. There are doubtless plenty of worthwhile problems in ... X industry ... where new answers could make real improvements ... But it is this very fact - the prospect of technological progress - which holds the danger. ... Some new process may make the existing one obsolete or product Y may oust X altogether. Then the prospects for scientists in the X industry are dim ... (pp 133-6)"

In all the written statements, and the formal and informal spoken comments of industrialists, the writer has never noticed the suggestion that a course, or even a subject, in 'the processes of X-technology' be established in a university. One suspects that the statements above, made by leading academic chemists, have their

origins either in history (as indicated by Holliday) or in the minds of the academics themselves. The implied 'demand' of employers is a gross distortion of their response to calls for discussion and co-operation in planning tertiary education, cf. Buley's statement quoted above.

CONSEQUENCES OF A CHANGE IN PERCEPTION

The preceding sections have described how academics design a curriculum without taking into account views on relevance other than their own. The main reason is that they do not experience the other perceptions in a persistent and telling manner. The author has been persuaded to take into account other perceptions as a result of conducting the survey described above. The consequential changes that have been made to a curriculum, within the scope allowed to an individual, are as follows.

The broad conclusion drawn from (i) the survey, (ii) the published statements of 'managers', and (iii) numerous discussions held with people responsible for the work of professionals is that:-

> the development of skills in analysing complex problems, selecting appropriate principles and data to solve them, and presenting the results in a convincing way is a more valid curriculum aim than the acquisition of up-to-date, sophisticated, principles and techniques of a particular scientific discipline.

Following from this conclusion, the curriculum has been modified to allow the students to concentrate on problem-solving and technical decision-making. Each problem has a substantial element of unfamiliarity, for the students. It is most noticeable that when students first encounter the 'new' type of curriculum they have much difficulty in analysis and formulation, even when the technical content is familiar to them. Some of the techniques have been reported elsewhere (Prosser, 1975, 1980).

There is no deficiency of intellectual challenge in a problem-solving curriculum - most students find it more demanding of their time and ability, but most recognise it as more worthwhile. The whole approach seems to be more consistent with the notion of education - less time is spent on reciting and recording factual and theoretical matter; these are obtained from books or duplicated notes. The time saved for the students is spent on them developing or using the knowledge. As the problem-solving curriculum is more consistent with the expectations of the 'managers' the 'fit between education and career' is much better than Jevons thought possible.

A further development has been to question the validity of the divisions that academics traditionally make in the curricula, e.g. organic, inorganic, and physical chemistry. It seems every discipline in physical science and engineering has such divisions. Regardless of how academic scientists choose to divide their research activities and departments - which often do not coincide with the divisions made by other research organisations - there seems to be a prima facie case for some options in science curricula to be related to the functions of scientists in industry and other major types of employment, e.g. research, technical services, production supervision, and high school teaching. The differences between these curriculum options would be in the tasks set, if problem-solving and technical decision-making were the primary activities, and the diversity of the principles used. The principles would be mainly up-to-date, sophisticated and scientific in the research option, but would be spread over a broad spectrum, beyond the bounds of physical science, in the production supervision option. The science education course, in which students study concurrently for B.Sc. and Dip. Ed., is a step towards the vocation-oriented course.

Major curriculum developments, such as those described here, will only become widespread if representatives of the various groups with valid perceptions meet together regularly for a sustained and frank exchange of views. The necessary mutual understanding between the groups has not been achieved by making speeches and writing papers that defend one particular perception.

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Students' Personality and Satisfaction with an Australian University: A Study of Interdisciplinary Differences

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ABSTRACT

A survey of 562 internal undergraduates (311 male, 251 female) at the University of New England indicated that the majority was fairly satisfied with university life. However, further analysis showed important differences in the attitudes of students in different faculties. Moreover there was some evidence that the different academic environments experienced by students in the various faculties may attract and satisfy students of different personality types. The importance of such findings for the proper understanding of students' adjustment to college life is pointed out.

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Although universities are presumably intended to promote special environments which facilitate learning, until recently there have been relatively few systematic investigations of the characteristics of those environments. Typically universities have been described in terms of formal categories such as their enrolment figure, faculty size, denomination, percentage of graduate students, research productivity of staff, etc. Inter-institutional comparisons have then been conducted using these categories and their effects on outcomes have been analysed (Blau, 1973; Richards et al, 1966).

While such formal categories are undoubtedly useful and have led to significant research findings, they can hardly be considered sufficient for understanding the inner workings of a particular institution. Intuitively it seems even more important to discover how the environment of a university is perceived by its consumers - the students of that institution. The pioneering work was done by Pace and Stern (1958), who asked students whether particular statements about teachers and students were true of their college. This general approach can be criticised for not necessarily providing an accurate account of university life, but it does allow students to describe that life as they see it, and this description is true for them no matter how it appears to other people. As Rogers (1965) puts it, "The organism reacts to the field as it is experienced and perceived. This perceptual field is, for the individual, 'reality' (p. 484)". It can be argued that so-called 'objective' measures are really only the particular investigator's own subjective perceptions. They do not necessarily represent the reality to which the individual responds. Viewed in this light any subjectivity involved in a measure of environment is an advantage, not a weakness.

Most of the early studies investigating college environments have used the total college as the environmental unit (Astin and Panos, 1969; Richards and Jones, 1970). Yet the limited work reported indicates that subgroups of students at the same university may perceive the college environment differently. Black and white students at integrated campuses tend to have different perceptions of university climate (Hedegard and Brown, 1969; Pfeifer and Schneider, 1974; Willie and Levy, 1972), while males may have different experiences at college than females (Field and Schoenfeldt, 1975).

However, most research has centred on the contention that students studying different courses may have different perceptions of the university. Gaff et al (1974) found considerable differences between Dutch students in four university departments on most of the dimensions of educational environment that they examined. Surveys of university students' and teachers' perceptions of the purposes and processes of tertiary education in the United States have also demonstrated consistent differences according to the major courses in which both groups are involved (Morstain, 1973; Stark and Morstain, 1978; Wilson et al, 1975). Stark and Morstain argued that results of such research may become more meaningful if concentration is placed on program areas within institutions. Nafziger et al (1975), in their study of students' satisfaction with college, considered that the students' major fields should be the unit of analysis as majors represent the immediate environment - composed of people and activities with which the students are in daily contact. This view is also supported by Weidman (1979), whose research demonstrated the importance of the contribution of academic departments to the non-intellective socialization of undergraduates. However, Braskamp et al (1979), in a study of the degree of undergraduate and graduate satisfaction with their major department, found field of study to be unrelated to satisfaction. Thus one aim of this research is to further examine interdisciplinary differences in student satisfaction.

To date there have been few attempts to investigate directly the link between personality and satisfaction with university. Yet, if the academic environments in the various faculties are sufficiently different, it may well be that the type of person who is at home in one faculty may not be happy in another. This contention is supported by work which suggests that different faculties attract students with different attributes (Hansford and Olphert,1979; Katz and Fleming, 1971) and that different cognitive styles are differentially adaptive in Arts and Science faculties (Biggs, 1970a, 1970b; Cropley, 1967; Hudson, 1968). It is argued that the task of the science student is largely one of building upon the highly structured subject material with which he is familiar from his school days. On the other hand, the Arts student is much more likely to be faced with relatively unfamiliar material often lacking the readily identifiable structure of Science subjects. The tasks required of the Arts

student are directly contrary to the 'closed system' thinking which is often appropriate for the science student. We might predict that an inflexible, dogmatic student would be more suited to a Science rather than an Arts course. Biggs (1970b) did indeed find that Science students scored significantly higher on dogmatism than did Arts students and also that for Arts males a significant negative correlation between dogmatism and performance was obtained. Additional support is provided by Nafziger et al., who found that students' satisfaction was a function of the congruency between students' personality types and college environment, analysed by major field.

This paper examines different aspects of students' perceptions of the University of New England. The university is situated at Armidale, a cathedral city with a population exceeding 20,000 people, on the north-eastern palteau of New South Wales. In 1976 the number of internal enrolments had risen to 2,566 full-time bachelor degree students and 713 postgraduate. The university offers traditional courses in the faculties of Arts, Science, Education and Economic Studies. It tends to attract a high proportion of its students from other than the capital cities. Many of these students enrol in the Faculty of Rural Science or the School of Natural Resources. The latter provides a four-year undergraduate program leading to the degree of Bachelor of Natural Resources, a professional course in the science and technology of natural resources management. A major feature of teaching is claimed to be the opportunity enjoyed by students for close contact with members of staff, made possible by the moderate class sizes and the highly residential nature of the university.

Earlier research at this institution showed significant differences in dogmatism among students enrolled in different faculties. However, it was Rural Science rather than Science students who tended to be the most dogmatic, while Arts students were the least so (Katz et al, 1965). Further, a comparison of dogmatism scores for students in their second year with their scores on the same test when entering tertiary study showed that there was a general lowering of scores and thus a general decline in dogmatism. However, Rural Science students did not conform to this pattern. This trend was confirmed in these students' third year of study. It appears that an inflexible, dogmatic person is likely to be more attracted to the Rural Science Faculty and that during the course he may well become even more dogmatic. It is reasonable to hypothesize that in the Faculty of Rural Science dogmatism will be positively related to satisfaction with the academic life. It is important to note that the School of Natural Resources, which may well attract students similar to those enrolled in the Faculty of Rural Science, had not begun at the time of the Katz et al study.

It is with these Australian students' attitudes to their university, then, that this study is primarily concerned. How satisfied were these undergraduate students with life at Armidale and at the University of New England? Were there faculty differences in their attitudes? Were the personalities of the students related to their level of satisfaction with the university? Were these students of different personality types more suited to one faculty than another? Thus this research was designed to provide a cross-cultural conceptual replication of the research in the United States which has suggested the value of using the students' major field as the unit of analysis when their academic environments are being analysed.

METHOD

A battery of inventories was distributed by mail during second term of 1976 to every third internal undergraduate student on the university files at that time. Usable replies were received from 562 students (311 male, 251 female). This represents an effective response rate of 60 per cent - fairly satisfactory for this kind of approach. Anonymity was assured as no name or code number was required on the response form. The instruments were an Attitude to University Life Questionnaire and the New England Personality Inventory (Fitzgerald and Cole, 1976) which measures the variables neuroticism, extraversion, and flexibility. In another paper the present author presents evidence of the reliability and validity of this personality inventory (Watkins and Hattie, 1981). The items included in the attitude questionnaire were based partly on the responses of withdrawing students to open-ended questions about their perceptions

of the university (Watkins, 1977) and discussions with other University of New England students and academics.

The SPSS programme (Nie et al, 1975) was used to factor analyse the Attitude to University Life Questionnaire and to obtain factor scores. The procedure of Cooley and Lohnes (1971) was used to conduct multivariate analysis of variance of these factor scores.

RESULTS

Student Ratings of Importance of Life Areas in Armidale

The students rated how important they considered various areas of their life in Armidale, using six-point Likert scales which ranged from 0 (not important) to 5 (very important). The mean responses are shown in Table 1.

It appears that the basic security needs - for accommodation, health, and finance - were considered most important by students. Recreation and psychological adjustment were also rated as very important.

Student Ratings of Satisfaction with Life Areas in Armidale

The students were asked to rate their over-all satisfaction with life in Armidale using a six-point scale ranging from 0 (very dissatisfied) to 5 (very satisfied). They seemed to be generally fairly satisfied with life in Armidale (mean rating = 3·37). Only 53 students (about 9·8%) claimed dissatisfaction. Statistical tests indicated that there was no significant difference between the sexes with respect to their satisfaction with their life in Armidale.

The students' satisfaction ratings of particular areas of life in Armidale are shown in Table 1. Finance, which the students had earlier rated as being quite an important part of their lives, is clearly a source of dissatisfaction for many of the sample. However, further analysis indicated that dissatisfaction with the financial area of life did not contribute significantly to the average student's satisfaction with either Armidale or the university itself.

Student Ratings of Importance of Life Areas at University of New England

The students were asked to rate, again using a six-point scale, how important they considered various areas of their lives as tertiary level students. The results are shown in Table 2. The students rated course content, assessment methods, their fellow students, and the teaching staff to be the most important aspects of their lives at university.

Student Ratings of Satisfaction with Life Areas at University of New England

The students were asked to rate, using a six-point scale, their over-all satisfaction with university life. The mean satisfaction rating was 3·50, indicating

that the majority of students was fairly satisfied. Dissatisfaction was claimed by 70 (12·5%) of the respondents, There was a fairly high correlation (0·67) between the students' over-all ratings of satisfaction with life in Armidale and with life at university. Although the relationship between these two variables is quite high, the students could apparently distinguish between the university and city areas of their lives. No significant sex difference was found between the mean ratings of over-all satisfaction with university life.

The students' mean satisfaction ratings with various aspects of university life are shown in Table 2. The respondents obviously tended to be very satisfied with their fellow students and to display mild satisfaction with other aspects. Assessment methods and tutorials were the main areas of dissatisfaction.

TABLE 1: Ratings of Importance and Satisfaction of Life Areas in Armidale

Life areas	Mean Ratings	
	Importance	Satisfaction
Accommodation	4·11	3·71
Finance	3·97	2·63
Transport	3·06	3·62
Health	4·35	4·14
Recreation	3·96	3·83
Entertainment	3·58	3·45
Social life	3·72	3·61
Sexual adjustment	3·59	3·70
Psychological adjustment	3·97	3·76

TABLE 2: Importance and Satisfaction Ratings of Life Areas at University of New England

Life areas	Mean Ratings	
	Importance	Satisfaction
Administration	2·75	3·02
Teaching staff	3·98	3·30
Fellow students	4·16	3·85
Lectures	3·57	3·10
Tutorials	3·67	2·96
Course content	4·34	3·16
Assessment methods	4·22	2·78
Union facilities	3·24	3·42
Social activities on campus	3·14	3·14

Factor Analysis of Attitude to University Life Questionnaire

The 38 variables contained in the Attitude to University Questionnaire were subjected to a principal axis factor analysis (1) followed by the normalised Varimax procedure. Using Cattell's scree test, four factors were retained. These factors accounted for 37·3 per cent of the variance.

The interpretation of these factors appears straightforward. Satisfaction with

university life has been split into two factors. Factors I (12·0% of variance) and II (8·6%) refer to satisfaction with and importance of social aspects of tertiary life, respectively. Factors III (9·5%) and IV (7·2%) refer, respectively, to the satisfaction with and importance of academic aspects of university life. A factor score was calculated for each subject for each of these four factors. The internal consistency of the items constituting these factors was satisfactory, α being of the order of 0·75 in each case.

Multivariate Analysis of Factor Scores by Faculty

A multivariate analysis of variance was then conducted on these four sets of factor scores, with faculty as the independent variable. The results are shown in Table 3. The value of Wilks' lambda was 0·94, while the over-all F(16,1683) for centroid discrimination was 2·09, ($p \leq$ ·01). Thus it is clear that there was a definite difference in the attitudes of students in at least some of the different faculties towards the academic and social aspects of their university life. The data suggest that differences in attitudes to academic life largely produced this result.

TABLE 3: Univariate Analysis of Factor Scores by Faculty

Variable	$F_{4,554}$	p
Satisfaction with social life	1·85	NS*
Importance of social life	1·50	NS*
Satisfaction with academic life	1·98	NS*
Importance of academic life	3·01	·01

* NS indicates F value is not significant at ·05 level.

The Scheffé multiple-comparison test indicated that significant differences ($p \leq$ ·05) were found between the following pairs of faculties: for satisfaction with academic life between Arts and Science; Science and Rural Science; Science and Economic Studies and for importance of academic life between Arts and Science. Examination of the mean satisfaction scores for each of the faculties indicated that Science students were considerably less satisfied with academic life than were Arts, Rural Science, and Economics students. Science students also considered academic aspects of college life to be less important than did Arts students.

Academic Attitudes by Faculty

Differences in the academic environments of the various faculties were investigated by comparing their students' importance and satisfaction ratings of the academic aspects included in this study. The results are shown in Table 4.

The Scheffé multiple comparison test indicated significant ($p \leq$ ·05) differences in some academic aspects between the following pairs of faculties: for importance of lectures between Arts and Science; Arts and Rural Science; Arts and Economics; Rural Science and Natural Resources; for importance of tutorials between Arts and Science; Arts and Natural Resources; Science and Rural Science; Science and Economics; Rural Science and Natural Resources; Economics and Natural Resources; for importance of assessment methods between Arts and Science; Arts and Economics; Science and Rural Science; Science and Economics; for satisfaction with tutorials between Arts and Science; Science and Rural Science; Science and Economics; for satisfaction with course content

between Arts and Rural Science; Arts and Natural Resources; Science and Rural Science; Rural Science and Economics; for satisfaction with assessment methods between Arts and Science; Science and Rural Science; Science and Economics.

TABLE 4: Analysis of Variance of Academic Attitudes by Faculty

Academic areas	$F_{4,554}$	p
Importance of teaching staff	1·63	NS*
Importance of lectures	6·11	·001
Importance of tutorials	12·50	·001
Importance of course content	1·50	NS*
Importance of assessment methods	4·55	·001
Satisfaction with teaching staff	0·77	NS*
Satisfaction with lectures	1·38	NS*
Satisfaction with tutorials	4·36	·01
Satisfaction with course content	5·99	·001
Satisfaction with assessment methods	5·43	·001

* NS indicates F value is not significant at ·05 level

TABLE 5: Analysis of variance of Personality Variables by Faculty

Personality	$F_{4,554}$	p
Extraversion	4·13	·01
Flexibility	0·68	NS*
Neuroticism	2·32	·05

*NS indicates F value was not significant at ·05 level.

Examination of the means of the students' ratings for each of the faculties indicated the following: Arts students considered lectures to be less important than did students in other faculties; Science and Natural Resources students felt tutorials to be less important than did other students; Science students were the least concerned with their assessment methods - although assessment was still rated by them to be quite important; Science students were the least satisfied with both tutorials and assessment methods - about half the Science students being dissatisfied with them; Rural Science students were rather dissatisfied with course content - far more than were other students. Some implications of these findings are discussed later.

Faculty Differences in Personalities

Students in different faculties were compared with respect to neuroticism, extraversion, and flexibility by means of multivariate analysis of variance. The results are shown in Table 5. The value of Wilks' lambda was 0·95 while the over-all $F(12,1460)$ for centroid discrimination was 2·39 ($p \leq ·01$). Therefore a significant multivariate difference in these personality variables was found between the faculties. Extraversion apparently largely accounted for this finding. The Scheffé multiple-comparison test showed that significant differences ($p \leq ·05$) in extraversion were

found between the following pairs of faculties: Arts and Science; Arts and Rural Science; Arts and Natural Resources; Science and Rural Science; Rural Science and Economics; Economics and Natural Resources. Inspection showed that Rural Science and Natural Resources students were significantly more introverted than students in other faculties. It might be suggested that the isolated existence often led by Rural Science and Natural Resources graduates (as farmers, park rangers, etc.) would attract the more introverted student.

Personality Correlates of Attitudes to University

The three personality variables included in this study were correlated with the factor scores representing attitudes to university life. The results are shown in Table 6. As would be predicted, extraverted students tended to lend more importance to and be more satisfied with their social life than did introverted students. Flexible students tended to rate their social life to be more important but less

TABLE 6: Correlations of Personality Variables with Attitudes to University

Personality variables	Social satisfaction	Social importance	Academic satisfaction	Academic importance
Extraversion	·15†	·23†	-·07	·07
Flexibility	-·26†	·11*	-·13*	·01
Neuroticism	-·28†	-·04	·07	-·05

† $p < .001$
* $p < .01$

TABLE 7: Correlations Between Personality Variables and Academic Satisfaction by Faculty

Personality variables	Arts (N=231)	Science (N=132)	Rural Science (N=51)	Economics (N=104)	Natural Resources (N=34)
Extraversion	-·09	-·06	-·32*	·09	·06
Flexibility	-·13	-·02	-·27*	-·14	-·48†
Neuroticism	·03	·05	·28*	·03	·43†

* $p < .05$
† $p < .01$

satisfying than more rigid students' (perhaps reflecting the highly organised social activities at this university, which the more flexible students may find restrictive). Neuroticism was significantly negatively correlated with satisfaction with university social life, indicating that, predictably, the less stable, more anxious student was often less able to enjoy his social activities than his better adjusted peer. None of the personality variables was significantly related to the importance attached to the academic side of college life. The correlations between these variables and satisfaction with academic life were also very low when the total student sample was considered. However, an interesting picture was indicated when these data were analysed by faculty. This is shown in Table 7.

Neuroticism and inflexibility were both significantly ($p < .05$) positively correlated with academic satisfaction for Rural Science and Natural Resources students. Thus it appears that the more anxious, dogmatic student was more satisfied with these faculties.

CONCLUSIONS

It is clear that the majority of these students was satisfied with their life both in Armidale and at the University of New England. However, there was evidence of major differences in the attitudes of students in different faculties to academic aspects of college life - the Science students being considerably less satisfied with their academic environment (particularly tutorials and assessment methods) than Arts, Rural Science, and Economics students. This may be partly due to (or the cause of?) the high failure rate amongst Science students at this University.

Rural Science students were far more dissatisfied with the content of their courses than other students. Earlier research has suggested that Rural Science students often felt their courses to be too theoretically oriented whereas they were more interested in practical applications of scientific principles (Watkins, 1977).

Students in various faculties also often showed differences in the importance they placed on the facets of their academic life. This may well be a reflection of the different academic tasks they are facing (e.g. tutorials are important in Arts rather than in science-based courses). Multivariate analysis showed that there were personality differences among students in different faculties - Rural Science and Natural Resources students being significantly more introverted than other students. Further analysis suggested that the more neurotic, inflexible student was more satisfied with these faculties. This finding is consistent with that reported by Katz et al, whose research further indicated that Rural Science students are likely to become more dogmatic as they progressed through their course.

It is true that the detailed results of this study may not be generalizable beyond this particular Australian university. However, this research does support, from a cross-cultural perspective, the claims of Stark and Morstain (1978) and of Nafziger et al (1975) that different academic environments may be experienced by students in different faculties at the same university, and that students of different personality types may be attracted to and satisfied by these different environments.

Whether these considerations could or should be taken into account by university selection committees is a debatable point beyond the scope of this article. Yet these factors should not be overlooked by counsellors or researchers if they wish to understand the environment to which the college student is trying to adapt (even though the size of the correlations indicates that the degrees of relationships involved are not sufficient for diagnostic purposes). This seems to be particularly important, as reviews of studies of student withdrawal in America have indicated the influence of the students' integration into the academic and social aspects of college life on their decision to persist or withdraw from their course (Pantages and Creedon, 1978; Tinto, 1975). This finding is supported in the Australian context by a recent major study by Williams (1982). The latter study, which involved students from fifteen Australian universities, showed that students who later withdrew from their courses had less positive perceptions of and were less satisfied with their university experiences than those who persisted with their studies. Moreover, recent research in the United Kingdom (Ramsden, 1979), since replicated in Australia (Watkins, 1982), has demonstrated that students' perceptions of their tertiary learning environment influence their approach to study and thence the quality of their learning.

FOOTNOTE

(1) A copy of the factor analytic solution is available from the author.

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Counsellor Contribution to Academic Goals: A Team Work Approach

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ABSTRACT

University teaching so often focuses exclusively on the subject being taught and takes little cognizance of the problems of the learner or of the learning process. This paper outlines an example of how the skills of a person outside the responsible teaching department (in this case a counsellor) were used to help Architecture students achieve the desired academic outcome. The counsellor's involvement had additional benefits for the students concerned. A case is made for utilising such a model for the benefit of a wider range of students.

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For a number of years first year Architecture students at the University of Sydney have been involved in community projects, in which they have been responsible both for the design and construction of buildings and recreation areas. They have had the opportunity to negotiate directly with a client, such as the Education Department or a local council, which has funded the project, and to gain experience in seeing the project through to its conclusion.

Students involved in such projects not only had to contribute their individual skills, but had to learn to function as a member of a design and construction team. From the very first project it was clear to the lecturer in charge that the students were ill-prepared for a team-work approach and he sought the cooperation of the Counselling Service in helping students develop the essential inter-personal and communication skills required.

The challenge for the counsellor was to help students, used to a competitive situation where individual excellence was rewarded, to arrive at a consensus by which a design was accepted to which all felt committed, rather than to choose the "best" design submitted by one of their number. The latter solution could be expected to promote rivalry and competition rather than a harmonious working relationship necessary for the successful completion of the practical construction exercise.

The approach adopted was one commonly used in human relations groups, the specific focus being on the concept of communication skills. Issues of trust and openness were explored and the method adopted was to set students a practical exercise in reaching consensus. While they worked on this exercise they were videotaped and the videotape was later used to illustrate the effects of their behaviours. By this means such issues as dominance, withdrawal and resentment were highlighted and their effects explored.

For example, the most dominant person in one group learned that although some of the others admired his forcefulness and confidence, they also resented his tendency to ignore their opinions, and some of them, in particular, felt unwilling to cooperate with him. The effects of such feelings on their working relationships and their capacity to bring the project to a successful conclusion were then examined.

The nature of the practical projects and the nature of the counsellor's contribution evolved over the years. Initially the counsellor was not invited to participate until the students had begun their individual designs. The time of involvement was quickly changed to allow the counsellor to work with the students from the outset so that the destructive development of rivalry and competition was forestalled. In the first few projects only a volunteer group of about fifteen students participated. Later an attempt was made to give all first year students the opportunity to participate. In this case the numbers (about 80) were too great for one counsellor to cope with and a model was developed whereby each student group allocated particular responsibilities to each member. One member of each group was allocated the responsibility of being the group facilitator whose responsibility was to help other members work together as a team. All these facilitators met with the counsellor who provided both training and support.

As one would expect, the effectiveness of the student facilitators was variable. However, the model adopted, in which one professional person, by working through others, can have some impact on the communication of about 80 persons, is a model worthy of attention. Here the counsellor has a teaching role, though the mode of teaching is chiefly experiential rather than didactic.

EVALUATION

A developing program of consultation such as that outlined rarely has a true evaluation component built in to it. That was true in this case also. Nevertheless, some information is available which can be used to evaluate the effectiveness of the consultation. This information is derived from three sources - from the student participants, from non-involved staff members and from academic performance.

From the very first time of counsellor involvement, students reported to their tutors that they had found the communications exercises of value to them, particularly in helping them gain confidence in their ability to work with others - and ultimately with clients. Staff members noted that, compared with students in previous years, these first year students were generally less defensive about putting forward their ideas and offering constructive criticism of each other's work. Levels of student participation, confidence and openness were all judged to have increased, while improvements in staff-student interaction had also been noted.

These developments are all desirable in their own right and would provide justification for the inclusion of the communications component. However, they did not provide any evidence that the counsellor's involvement had any effect on the quality of student performance. Eventually, some information on this issue did become available.

On the last occasion on which the counsellor worked with the first year students, all of them were involved in working on school playground projects. There were several such projects, each involving groups of about fifteen students. For various reasons including changes in responsibility for the first year program, only one group was involved in a communication component, this group working with a counsellor in the same manner as in previous years. At the completion of their projects each student had to submit an individual work book outlining the nature of the design problem and the nature of its solution. When the students' work had been graded it was noted that all students who had been in the group with the communications component were graded at the top of the scale. Moreover, the persons responsible for their grading were not the persons supervising this particular group and, therefore, had no bias in their favour.

Academic staff not only commented on the quality of the design solutions achieved but also commented that the group were so much more aware of how to go about achieving a satisfactory solution.

The important message to be learned from the series of experiences outlined in this paper is that there is more to the learning experience than the provision of subject matter. Emphases in tertiary teaching are too often placed exclusively on the nature and challenge of the academic content. Too little attention is paid to the process of learning or to the factors which facilitate the learning process for the student. Our experience with Architecture students has demonstrated that by helping them to be more aware of personal and inter-personal issues the quality of the work is enhanced while the learning experience proves to be more satisfying.

However, it is not sufficient for counsellors to work with students alone, for lecturers and tutors are important persons in the day to day interaction with student groups. They too need to understand the communication issues which have been explored between students and counsellor. Therefore, future developments of such programs should provide for academic staff to participate. By so doing it should be possible to achieve a situation in which many staff members become competent to conduct similar programs for students while counsellors fill a purely consultative role. By this means staff resources can have maximum coverage, and if the counsellor is effective in a teaching role, there should be no loss in effectiveness of the program.

In the long term such a development could be expected to enhance the quality of staff-student interaction within the university.

PUBLICATIONS FROM

HERDSA

Miller, A.H. and Ogilvie, J.F. (Editors) (1981) **Bringing Computers into College and University Teaching.** ISBN 909528-15-2, pp iv + 74.

Papers presented at a one-day HERDSA symposium at the Australian National University in November 1980. Contributions review recent developments in hardware production and attitudes toward CAL, and report applications in the teaching of a wide range of subjects. A 105-item bibliography provides a guide to the recent literature on CAL.
AUS $6.00 (AUS $4.00 for HERDSA members)

Powell, J.P. (1977), **Higher Education A Select Bibliography**, Vol. 3. 1970-75 and supplement to Vol. 1. ISBN 0-909528-07-1, 162 pp.

The bibliography covers a wide area of the literature in higher education. References are given under the following major headings: Higher education in Britain and Australia, history of higher educaiton, aims and functions of higher education, curriculum, teaching methods, examinations, the academic profession, students.

Although comprehensive in scope, it is highly selective in detail and serves as an essential guide to academics, research workers, administrators and students interested in tertiary education.
AUS $10.00 (AUS $5.00 for HERDSA members)

D.J. Boud, J.G. Dunn, T. Kennedy and M.G. Walker (1978), **Laboratory Teaching in Tertiary Science — A Review of Some Recent Developments.** ISBN 0-909528-08X, 108 pp.

This review surveys the developments which have taken place internationally over the period 1970 to 1977 in laboratory teaching in undergraduate courses in physics, chemistry and biology.

Eight major types of teaching methods employed in laboratories have been identified, the principal innovative features of each approach have been analysed, and the reported advantages and disadvantages have been noted. The individual reports surveyed have been summarised in a form which the authors hope will enable tertiary science staff, interested in assessing new techniques in laboratory teaching, to make initial judgements of the appropriateness of each approach to their own interests and situations.
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Volume 3 (1980): Miller, A.H. (Editor) 250 pp.

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Volume 4 (1981) Wellard R. (Editor) 432 pp.

Papers presented at the seventh annual conference held in Melbourne, May 1981.

The conference theme was "Teaching and Learning in the Disciplines in Higher Education".

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Review Articles

The Journal of Tertiary Education Administration: The First Thousand Days

The launching of a journal, especially one concerned with an area in which there is comparatively little scholarly activity, calls for considerable nerve at the best of times, but when that area is the administration of higher education institutions, what is called for is not mere nerve, but good old-fashioned cheek as well.

When the Journal of Tertiary Educational Administration was first mooted the cynics hooted with laughter, but the editors have shown in no uncertain manner that there is indeed a demand for a quality periodical in the field.

Of course, its founders were helped considerably by the Kellogg Foundation funds which were channelled through Bob McCaig's Institute of Educational Administration at the University of New England. Like so many other areas of development in the theory and practice of tertiary education Kellogg funding provided the priming funds to "get the ball rolling".

The first issue appeared in October 1979 and it has appeared six-monthly since that time. For the purposes of this review article I was sent five issues - Vol.1, No.1, October 1979 through to Vol.3, No.1, May 1981: hence my reference in the title to the "first thousand days".

In the very first issue Colin Plowman, President of the AITEA, pointed out that the Journal should fulfil two key functions - the dissemination of knowledge in areas of concern to members and the reporting of the activities of the Institute and its branches. As he so correctly put it, there was a significant lack of discussion and communication in Australia on topics related to tertiary education and especially to the administration of tertiary institutions.

This paper is about the first of Colin Plowman's key functions: only individual members of AITEA can say whether the Journal has acted as a satisfactory reporter of the Institute's affairs.

THEORY, RESEARCH AND PRACTICE

From first glance it is obvious that the Journal is designed to cover a broad range of interests, from what is often loosely referred to as the "theoretical" through to the "practical". In an attempt to classify articles according to their "theoreti-

cal" (including "research") as opposed to their "practical" content, I categorised them into the rough areas of research, theory and "how to do it". It came as something of a surprise to find that the articles distributed themselves as follows: "Research" 6, "Theory" 5 and "How To Do It" 39.

On reflection, I should not have been surprised. These figures show that the Journal is, perhaps of necessity, trying to be "all things to all men". A senior manager in business has the choice of a spectrum of magazines ranging from the research oriented Australian Journal of Management published by the Australian Graduate School of Management, through the middle-of-the-road Practising Manager put out by The Australian Administrative Staff College, to the "how to do it" Rydges and the more popular analysis and commentary approach of the Australian Business Review.

To some extent at least the Journal is trying to cover all of these markets, finishing up somewhere between The Practising Manager and Rydges. It does not and, of course, should not seek to rival the news content of the Australian's weekly "Higher Education Supplement" so ably edited, until recently, by John Bremer.

Yet although the Journal is no news magazine its articles do reflect the problems which face contemporary administrators - mergers, the so-called steady state and scarcity of resources being cases in point. It must be said right away that one of the most obvious characteristics of the Journal is the lack of articles which report on research projects undertaken in the area of university and college administration. Prima facie this seems surprising, insofar as universities are concerned, at least, for universities are by definition research-oriented institutions and their academic staff are appointed and promoted largely on the basis of their research competence.

To be sure I am by no means the first writer to point out that universities are good at researching everything except themselves, but there is some activity, much of it very good, and it is a little sad to see so little reporting in the Journal of the limited number of good masters and doctoral studies in the area which are known to me.

An unkind observer could point out that the contents of the Journal consist largely of opinion, restatements of folklore and presentations of homely truths -- and he would be right. Perhaps the reason for the lack of tighter, probing studies is their unpopularity. Investigations into the efficiency of management have never been particularly popular with managers, as Robert Presthus pointed out nearly twenty years ago in his classic comparison of the government-based British European Airways and the free enterprise British Eagle Airways.

As suggested above an area avoided by most authors is that of theory. Indeed, in the five issues there are few articles which set out any cohesive constructs which help to explain or predict the nature of organisational behaviour. For this author, theory is the most practical concept: it seeks to explain WHY. In the words of John Dewey:

> "Theory is in the end ... the most practical of all things, because the widening of the range of attention beyond nearby purpose and desire eventually results in the creation of wider and farther-reaching purposes, and enables us to make use of a much wider and deeper range of conditions and means than were expressed in the observation of primitive practical purposes."

Fortunately for the Journal it is saved from being a research/theory wasteland by the work of its most prolific contributor, Dr. Norman Dufty who, interestingly enough, hails not from a university but a CAE. His three contributions are all designed to produce speculation and argumentation, as good scholarly articles should. He concludes "Representation in Academic Decision-Making" (Vol.3, No.2) with the hypothesis that:

> "... if all committee members were elected, and elected their own chairman, the membership of committees would not change to any marked degree. There would be a tendency to elect deans because of the influence seen to originate in their personal status and powers of persuasion and in the light of the absence of evidence that their value structure was inconsistent with

> that of their organisational units. Even if there were some change in committee composition conditions in organised anarchies are such that the decisions made would probably be the same."

This was, of course, a development of his excellent article "Are Universities Rational Organisations?" (Vol.2, No.1) in which, following a number of US authors, he developed the theme that universities are essentially "loosely coupled federations, holding companies for professional groups". Dufty's concluding statement in that article read:

> "Finally, the academic administrator should be ever-watchful of the fallacy of misplaced concreteness and the sin of over-simplification. He will hardly need reminding of the value of appearing rational even in circumstances where the achievement of this happy state is impossible."

In another article, "Trust in Academic Leaders and Committee Operation" (Vol.2, No.2), he concluded:

> "... the major lesson to be learned is the apparent ineffectiveness of representative democracy by constituency election or by group (the Staff Association) and the effectiveness of delegation or participative democracy ... Institution-wide decisions should be minimised and made by small committees as few motivational advantages appear to accrue from the use of large representative bodies."

Reading Dufty, one is struck by the relevance of Chesterton's observation, "I have seen the truth and it makes no sense." Just so. Practitioners need researchers like Dufty ceaselessly to remind them that "common sense" does not always hold the keys of the kingdom in university administration any more than it does in the natural or social sciences generally.

It is, however, understandable that a wide range of practical approaches should be reflected in the Journal's articles. As Campbell and others put it in Administrative Theory as a Guide to Action:

> "When a scientist tests his predictions he limits his attention to ... small pieces of reality, ignoring the wealth of other processes occurring around him ...
>
> The manager's world is quite the reverse. It is the complex, baffling world of the here and now. It is the unique, concrete situation with its own history and tradition and its own cast of idiosyncratic characters. Each piece of reality slides into the next piece, acting back on it to colour and reshape it."

This picture of the administrator's world is well represented in the writings of the Journal's second most prolific contributor, Ray Marginson, who emerges as a "doer". His articles on the financial manager ("The Financial Manager - Steward or Entrepreneur?", Vol.3, No.1) and energy control ("Energy Management at the University of Melbourne", Vol.2, No.2) are models of the lucid presentation of challenges facing the real world of the administrator. Reading these papers, one is struck by the relevance of one commentator's reference to "the buzzing confusion of the administrative day" and to another's concept of the effective administrator possessing "the grasshopper mind".

CONTRIBUTORS

To even the least serious reader it is obvious that an outstanding aspect of the Journal is the seniority and functional mix of its contributors. Authors include Directors of Institutes, Professors, Deans of Faculties and Schools, Registrars and a sprinkling of Senior Lecturers. Academe mixes admirably here with administrators.

Of course, this mix is to some extent achieved by printing talks given by some very senior administrators who normally have little time for writing - but the editors are to be congratulated for using just this strategy to expose the views of such people. This certainly has the effect of providing diversity and difference in the Journal's contents. Just the same, it would be nice to know where the Vice-Chancellors are. Do they not write about university administration? Are they not invited to speak at AITEA conferences? If not, one is justified in asking, why not?

The sources of the articles should prove of interest to most readers. As far as I could ascertain the 51 articles originated as follows:

Universities (Australia)	20.0
Universities (overseas)	3.0
CAE's, Institutes	13.5
AVCC	5.5
Public Service	4.0
State Co-ordinating Committees	2.0
Management Education Institutions	2.0

There are no real surprises here, the universities, the traditional source of those ready to "write", providing most of the articles, the CAE's coming second in numbers, and the various federal and state co-ordinating bodies being the source of the bulk of the remainder.

It is perhaps of interest to note that with respect to reviews, most, after the first issue, relate directly to higher education.

COMPETITORS

The Journal of Tertiary Educational Administration has few competitors. The Australian University, published by the Australian Vice-Chancellors' Committee, had a short and uneven reign and obviously did not attract enough readers to justify its survival. Personally, I found it very interesting, well written and professionally produced. It is a pity that it folded.

The only other substantial journal is Vestes, the journal of the Federation of Australian University Staff Associations. It began well with contributions from a reasonably wide spectrum of academics and a few administrators, but it increasingly became an organ for tertiary education units, adult educators and a few academics from Faculties of Education. Further, its editors permitted an uneasy and irritating mix of scholarly articles, warning notices and trade union-type tirades. In many ways the epitome of the curate's egg, it declined until rejuvenated in recent years under the editorship of John Anwyl of the University of Melbourne. It is now the Journal's only real competitor.

The only other journal to carry a substantial number of articles of direct significance to higher education administrators was, and is, the Journal of Educational Administration, founded in 1963. Now approaching its twentieth birthday, its emphasis is towards schools rather than colleges and universities but it remains good reading for people in higher education.

The other Australian journals like Unicorn, Forum and the Australian Journal of Education carry only occasional articles of direct relevance to administrators in the tertiary field.

It is perhaps worth making the point that the Journal is attractively produced and competently edited. As one would expect of such a publication it is largely free of typographical errors and poor syntax. Type-face is clear and a good quality paper is used. Binding is satisfactory and the glossy cover well presented.

With regard to the articles reproduced, too few make any attempt to provide

synopses or abstracts as a guide to readers. ' If the editors find it impossible to prise these out of authors and have not the time to prepare abstracts themselves, they might give consideration to using "boxes" to highlight significant quotes from the articles. The latter alternative is, of course, second-best. With the growing demand for abstracting services, including computerised services, it behoves all authors to practice the preparation of brief abstracts - especially if they hope to avoid or at least reduce the curious emphases sometimes given by professional abstracters in their reading of articles.

QUALITY

"Very well". the impatient reader might exclaim, "you've commented on various aspects of the Journal, but you haven't really given me an assessment of its quality. After all you described it as a 'quality' journal at the beginning of this article. Is it worth buying? How good is it?"

In response I can only draw attention to what Robert Pirsig had to say about "quality" in his Zen and the Art of Motor Cycle Maintenance:

> "You know what it is, yet you don't know what it is. But that's self contradictory ... If you can't say what quality is, how do you know that it even exists? ... For all practical purposes it does exist. What else are grades based on? Why else would people pay fortunes for some things and throw others out on the trash pile? Obviously some things are better than others ... But what's the 'betterness'? ... What the hell is quality? What is it?"

When it comes to evaluating a rarity such as a lonely magazine like the Journal the answer will depend largely upon what the particular reader is seeking. Personally, I like its variety and spread of articles and its professional presentation. I enjoy reading it and I would advise readers to subscribe to it.

In his introductory message to Vol.1, No.1 Colin Plowman wrote:

> "The first issue of a journal of a professional institute may not create much of a ripple in the great ocean of journals throughout Australia but it will, I believe, create a considerable and enduring wave of interest among those who have a concern for the institutional health of tertiary education establishments".

In my view the Journal has almost single-handedly done just that and I, for one, hope that it will continue to do so for many more thousands of days.

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Breaking Down the Barriers to Adult Involvement in Higher Education

The Modern Practice of Adult Education: from Pedagogy to Andragogy (revised edition), Knowles, Malcolm S. Chicago, Ill.: Follett Publishing Company, 1980.

Learning at the Back Door: Reflections on Non-Traditional Learning in the Lifespan, Wedemeyer, Charles, A. Madison, Wis.: The University of Wisconsin Press, 1981.

Non-traditional education, by the very nature of its title, suggests a reaction against and a departure from that which is accepted or standard within the educational institution at any particular point in time (Commission on Non-Traditional Study, 1973). Adult education, similarly, has frequently been seen, by both its protagonists and its antagonists, as a compensatory reaction against the perceived uniformity in or standardisation of formal educational provision (Lowe, 1975). The arguments for both non-traditional and adult education have, indeed, much in common, such as a concern for meeting the needs of variously disadvantaged potential learners, a commitment to the provision of education in a form and at a time and place that are most suitable to the learners, and a belief in the value of vesting educational control in the learners themselves.

The authors of the two texts reviewed here identify centrally with this broad orientation, and more particularly with the North American philosophical tradition of education for individual growth and development (Elias & Merriam, 1980).

Knowles, from a psycho-sociological perspective, identifies adult characteristics which are more or less different from those of children, and develops a normative philosophy of educational practice which embraces these characteristics. Wedemeyer, arguing from the premiss that responsible individuals want and need education throughout their lives, concentrates on the problems of accessibility and the changes necessary to increase involvement in education, especially by adults.

Until recently, education was considered to be largely the preserve of children, adolescents and young adults. Once the latter had acquired their initial education, the educational institution largely withdrew its support of and involvement with their further learning (Harrington, 1977). The provision of subsequent educational opportunities has not, by and large, been based upon any systematic conceptualisation of continuing education or training as addressing either individual or societal needs. Nor have the majority of formal adult education opportunities been formulated on the basis of planning principles that take cognizance of the differences between adults and children as learners (Kidd, 1973). Adults wishing to enter or re-enter higher education have been (and substantially still are) expected to fit into systems designed to serve the situations and characteristics of largely adolescent students. Bodies which have been established specifically to cater for the learning needs of adults have always been marginal elements in the pre-adult organisations with which they have been associated, suffering disproportionately in times of contracting public support for education, and remaining generally weak in periods of educational expansion (Clark, 1958).

However, the last three decades in particular have been characterised by an increasing need and demand for adult education, with a concomitant growth in the size and scope

of educational opportunities for adults (Lowe, 1975). In many developing countries, adult education is now used as a major tool in programmes of social change and development (Coles, 1977). In the more highly developed countries, the increased rate of social change has greatly heightened the demand for re-training and the need for individuals to adapt in other ways (Darkenwald & Merriam, 1982). The informal learning which previously was believed to be sufficient for the maintenance of adults as capable and contributing members of society is no longer seen to be adequate. For example, recent surveys have identified a substantial proportion of the adult population in highly developed countries (including Australia) that is functionally illiterate and/or innumerate (Dymock, 1982). Substantive areas such as education for effective parenting, retirement, and entry or re-entry into the labour force have also been recognised as important societal needs (Peterson et.al., 1981). The magnitude, complexity and diversity of necessary individual change is increasingly viewed as requiring more formal educational provision for adults.

Knowles also argues that traditional, formal, schooling practices actually discourage the maintenance and development of independence and self-directedness in learning, the attendant attitudes and skills of which are needed by adults if they are to successfully assume responsibility for their own development. Traditional educational practice he terms pedagogy, and defines as the art and science of helping children to learn. This he contrasts with 'andragogy', initially defined as the art and science of helping adults to learn (Knowles, 1970), although he now acknowledges that it is applicable to pre-adult education in some circumstances and that, conversely, pedagogy has applicability in certain instances with adult learners (Elias, 1979; Knowles, 1979).

Knowles identifies a number of characteristics of adulthood, which he perceives as a quest or progression, rather than as a state of being which may be fully attained. These characteristics, he condenses into four 'assumptions' about the nature of the adults as learners, and which he uses as the conceptual basis for his approach to the design and management of educational events for adults. The four assumptions, paraphrased, are that as individuals mature: (1) their self concepts change from those of dependency to those of self-directedness; (2) their experiences or prior learnings become an increasingly rich resource for learning; (3) their readiness to learn becomes less conditioned by societal requirements and more governed by their individual life problems and developmental tasks; and (4) their orientations to learning move from those subject-centredness and delayed application, to those of problem-centredness and immediate application.

From these assumptions, Knowles then develops a set of principles for guiding the design and management of adult education events. The principles are formulated as a means by which educational events may be structured to acknowledge and further develop learners in terms of the identified characteristics of adulthood. The gist of the resulting approach to education is that, in all stages of programme design, implementation and evaluation, the learners or potential learners must be involved as joint decision-makers with the programmer, curriculum designer, or instructor.

This book, which draws together much of the Knowles' earlier work (e.g., Knowles, 1950, 1967), is written as a practical guide to andragogical practice. Of the three main sections in the text, the first examines the nature of adult education, and develops the argument for an andragogical, as distinct from a pedagogical, approach. The second section addresses the design and management of educational programmes within the andragogical framework, and the third focuses on the design and management of specific teaching-learning (instructional) events. An extensive collection of appendices (140 pages in total) provides examples of programme materials for the various stages in this approach to education. Each chapter includes a selection of relevant references to further reading. These lists have been supplemented since the first edition of the book was published (Knowles, 1970), although the text references appear to have been left largely unchanged.

As one of the most comprehensive, readily available guides to adult education practice, the first edition of this book has had a substantial impact on non-formal adult education, both in the United States and elsewhere. However, taken as a whole, Knowles' andragogical approach is less applicable to formal higher education. In particular, his learner-centred orientation to the formulation of learning goals, and in the evaluation of the learning, are not highly congruent with the norms and expect-

ations surrounding traditional higher education courses. On the other hand, the principles and their associated educational practices may be applied to varying degrees in higher education as means of responding to the increasing numbers of mature-aged students in Australian higher education courses. Further, this work has practical implications for the design and management of non-traditional forms of higher education, such as those that provide credit for work or life experience (an increasingly important feature of tertiary courses in the United States and Britain).

From this perspective, adult education should be viewed as the design and management of learning opportunities for adults (Lawson, 1975), rather than as a social movement which excludes certain forms of provision (commonly full-time study for credit). The psychological basis of Knowles' approach is consistent with the former conception, and supports the validity of transferring the concepts and practices to higher education.

While the logical and empirical bases for the distinction between andragogy and pedagogy - as they are applied to adult and child education - are questionable, andragogy does constitute a practicable and largely internally consistent normative philosophy for the guidance of educational practice. In this book, Knowles presents his formulation of andragogy, its supporting arguments and examples in a convincingly straight-forward style, which does much to bridge the all-too-common gap between educational theory and practice.

In his book, Wedemeyer explicitly addresses non-traditional learning throughout the human lifespan, although, in reality, the major part of this work focuses on education in the adult years. Consistent with his extensive professional involvement with distance education and educational technology, the role of these in non-traditional education receives considerable attention. Of the four main sections in the book, the first looks at the social background to non-traditional education, the second examines its form, the third focuses particularly on the application of technology and approaches to the design on non-traditional programmes, and the final section provides an overview of educational aims throughout the lifespan and the appropriate forms and functions of non-traditional education in meeting these aims.

The author identifies his purpose in writing the text as being the development of, to some degree at least, a field theory of non-traditional education ('learning'). As a compilation of knowledge on the subject, the groundwork for tackling such a goal may well have been undertaken, but the material is not in any sense sufficiently integrated for it to assume the character of a theory. Although the uses to which the text is intended to be put are not entirely clear, much of it is concerned with persuasive argument for the diversification of educational provision as a means of ensuring that relevant and appropriate education is available to all of those persons who require it, in a form and place, and at times which are suitable to the potential learners.

Beyond its normative arguments, the text is essentially descriptive and analytical, exploring the nature of non-traditional education, and its implications for educational practice. Procedural aspects are examined in a scholarly fashion, rather than being presented as the recipies for practice which characterise Knowles' contribution.

The author has made a valiant attempt to clarify the confusion surrounding the multitude of concepts and terms pertinent to his subject matter (such as: open learning, external study, distance learning, and independent learning). However, this type of conceptual activity does not emerge as being one of his strengths. He confuses such fundamental terms as learning and education, fails to understand the difference between their descriptive and programmatic meanings, and manages to define the subject matter of the book ('non-traditional learning') only rather vaguely as, on the one hand, education which is in some sense not a traditional component of the educational institution and, on the other, as:

> an umbrella term that covers learning that is usually carried on part-time, and is initiated by, and largely under the control of the learners themselves. It is usually self-paced and self-evaluated. (p. XXV)

While the subject matter has been thoroughly researched, exhaustively presented, and is well written and referenced, considerable text space is occupied through the

repetition of arguments, scattered throughout the whole work, for the further provision of non-traditional education. The text would have benefitted greatly from a severe reduction of its length. It is also overtly and overly oriented towards North American society - a feature which may irritate a number of antipodean readers - although the content would, in large measure, be no less applicable to Australian conditions.

As evening reading for the frequently embattled devotees of non-traditional education, this book could well be viewed as a timely state-of-the-art review. To the unconverted traditionalist, it could well provide new insights and develop some commitment to change, at least if the reader has the time and mental fortitude to peruse the whole book. For those educationists and educational policy-makers who are looking for a practical guide, however, this publication would prove to be a tantalising but frustrating source of guidance.

To the extent that Wedemeyer's arguments for non-traditional education are shown to be accurate, the message for those educationists who work in higher education is clear: embrace non-traditional education or be left behind in the competition for students and attendant support. The increasing popularity of external degrees, both in Australia and elsewhere, is certainly one item, among many, of supportive evidence for this position (Houle, 1973).

The similarities between the kinds of learner-centred education which Wedemeyer and Knowles are arguing for are striking, as is their shared missionary zeal. However, the texts are more complementary than parallel in their specific content. Where Wedemeyer provides a broad conceptual view of the field and its component elements, Knowles concentrates on the practicalities of programme design within a learner-centred philosophical framework.

For those among us in higher education who still adhere to a conception of the field as being properly a time-limited, campus-based, discipline-centred exploration of bodies of knowledge, under the control of appointed professors of that knowledge, I certainly recommend a reading of the Wedemeyer work. For those of us who are sufficiently courageous to actually attempt appropriate change in higher education, Knowles book should be referred to for some practical ideas, if not a complete alternative system.

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NOTES FOR CONTRIBUTORS

Contributions are invited, dealing with any aspect of higher education, which seek to improve practice through research, evaluation or scholarly reflection. Papers concerned with both the practice and theory of higher education in specific disciplines are welcome. Contributions which cut across specialist disciplinary or research interests to focus upon the central concerns of higher education will be especially welcome. Authors are also encouraged to publish brief research reports and make detailed data available to readers on request. Each issue will include a major review of an area of educational practice or research: those interested in preparing such a review should contact the editor. Book review articles and critical notes will also be published.

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